

## ABSTRACT

Title of Thesis:                      REFRAMING AGING AS GROWTH  
THROUGH COMMUNITY

Min Na, Master of Architecture, 2020

Thesis Directed By:                Professor of the Practice, Peter Noonan, School  
of Architecture Planning and Preservation

The human lifespan has steadily increased over the last two centuries; however, the level of life satisfaction in later life shows a steep decline. Everyone is susceptible to aging. How can we gracefully embrace the transition as we age later in life? How can we be prepared for the future when we retire earlier than we anticipated? And in certain cases, how can someone cope with aging alone? This thesis will review our cultural perspective on aging and its negative impact with respect to society that is harmful to people of all ages. This thesis aims to explore creating a sustainable built environment to alleviate age-related socioeconomic issues and, as a result, embrace aging, live healthier, and grow together.

REFRAMING AGING AS GROWTH  
THROUGH COMMUNITY

by

Min Na

Thesis submitted to the Faculty of the Graduate School of the  
University of Maryland, College Park, in partial fulfillment  
of the requirements for the degree of  
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Advisory Committee:

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## Dedication

To dear my dad in heaven. I wish heaven had Zoom.



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## List of Abbreviations

ADEA: Age Discrimination in Employment Act

AJPH: American Journal of Public Health

BPL: Better Possible Life

BDP: Bethesda Downtown Plan

GSF: Gross Square Feet

SSA: Social Security Administration

WHO: World Health Organization

HUGS: Help Us Grow Strong

## Chapter 1: Introduction

The interest in helping vulnerable social groups of people originates from growing up in a large extended family, with grandparents and parents and later with a niece and a nephew. Conducting social work job experiences over the past three years at an adult daycare center has made even more invested in extending a helping hand. Parenting or caring for a dependent is a part of the life cycle; however, it is often challenging for many individuals and most modern-day families.

“People must take a modicum of public responsibility for each other even if they have no ties to each other. This is a lesson nobody learns by being told. It is learned from the experience of having other people without ties of kinship or close friendship or formal responsibility to you take a modicum of public responsibility for you.” (Jacobs 1961, 82)

This quote from *The Death and Life of Great American Cities* offers insights into how we cope with today’s age segregation and public life in the community. Along the same lines, this thesis addresses socio-economic challenges we are facing as its population grows older. The research highlights on creating a sustainable community that naturally encourages social interaction between generations and developing community-based programs in which people of all ages has the opportunity to learn, work, and play together and ultimately improve the quality of their life. This thesis, therefore, explores spatial strategies to create a built environment that promotes social interaction and potentially applicable widely to grow statewide.





Figure 1-1 True community: where community engagement occurs across generations  
(Source: author)

## Chapter 2: Aging population in America

### Population aging and its impacts

The world's demographic is shifting by a rapidly aging population. Japan has the world's oldest population, where one-fourth of the population is older than 65 while Europe, notably Italy and Germany, has one in five people who are over 65 years old.<sup>1</sup> Figure 1-1 shows “the graying of America,” while figure 1-2 also shows the steady growth of the older population (ages over 65) catching up the younger population (ages under 18), starting mid-2030s.

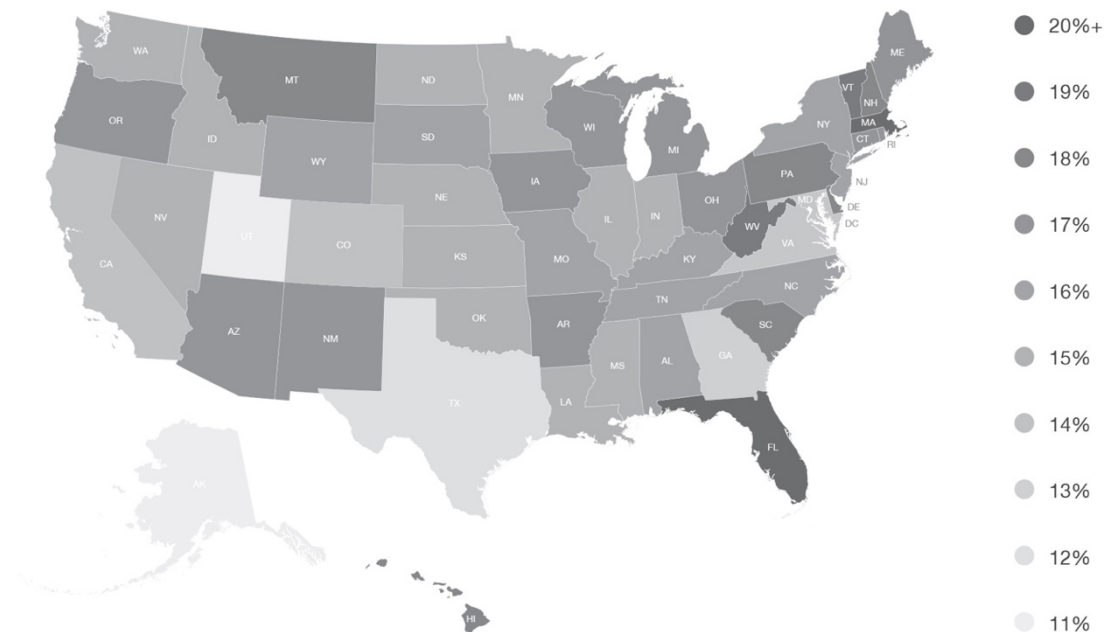


Figure 2-1 Distribution of senior population, aged 65 and over, in 2020  
(Source: author, Data: U.S. Census Bureau)

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<sup>1</sup> Scherbov, Sergei and Stefanie Andrichowicz. “Aging Demographic Data Sheet 2018” *International Institute for Applied System Analysis*, Accessed March 15, 2020, <https://iiasa.ac.at/web/home/research/researchPrograms/WorldPopulation/News/180115-ADS.html>.

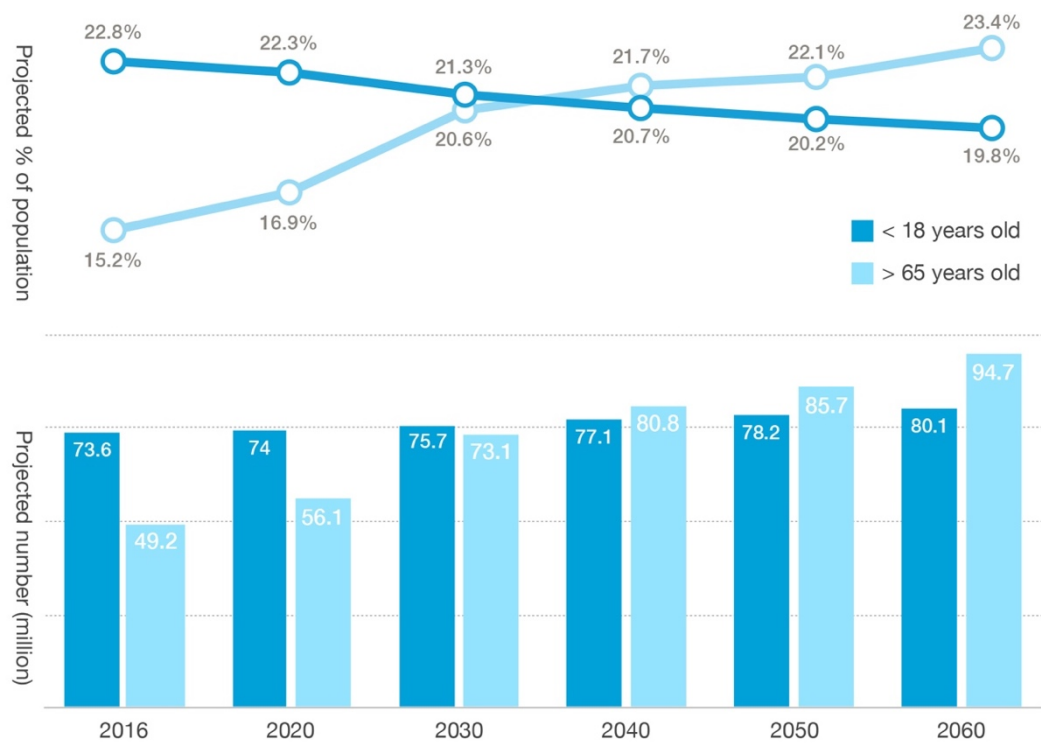


Figure 2-2 Projected number of children and older adults  
(Source: author, Data: U.S. Census Bureau, 2017 National Population Projections)

The primary fact for the unprecedented demographic changes in America is the aging baby boom generation.<sup>2</sup> Baby boomer refers to a person who was born between 1946 and 1964 in the post-World War II period and whose age is between 56 to 74.<sup>3</sup> With the baby boomers' sheer size – over 70 million – in the United States, they have been a significant force for generating economic growth in the United States.<sup>4</sup> The

<sup>2</sup> Vespa, Jonathan. "The U.S. Joins Other Countries with Large Aging Populations." *U.S. Census Bureau*. Accessed March 21, 2020. <https://www.census.gov/library/stories/2018/03/graying-america.html>.

<sup>3</sup> "Baby Boomer" *Merriam-Webster.com Dictionary* (n.d.). Accessed March 22, 2020, <https://www.merriam-webster.com/dictionary/baby%20boomer>.

<sup>4</sup> Chappelow, Jim. "Baby Boomer." *Investopedia*, February 28, 2020. Last modified February 28, 2020. Accessed March 22, 2020. [https://www.investopedia.com/terms/b/baby\\_boomer.asp](https://www.investopedia.com/terms/b/baby_boomer.asp).

youngest baby boomers anticipate their retirement within a few years. Many editorials and the Social Security Administration (SSA) have expressed the concern that having such a large population becoming economically inactive en masse will have a notable impact on the U.S. economy: labor shortage, imbalance ratio of working age to retiree, and inadequate pension system welfare<sup>5</sup>.

### *The real meaning of retirement*

Although retirement may sound like a dream to many workers, it is essential to look at what it means now. The idea of retirement did not exist until the late 19th century. Most workers in past generations worked as long as they were capable of, and they did not live long as we do today. The Chancellor of Germany, Otto von Bismark(1815–1898), initially selected 65 as the retirement age, when he planned a social security pension for the aged German workers in the 1880s.<sup>6</sup> When the idea was introduced to America in the 1930s, the average lifespan was indeed only 60. Today, the average life expectancy in the U.S. has been continuously rising, unlike the time the concept of retirement was established. Figure 2-3 indicates that how much human lifespan has been increasing over a century: 10 years between 1950(68.1 years) and 2020(78.9 years) and an additional five years by 2050(83.4 years).

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<sup>5</sup> Nikolova, Milena. “Two Solutions to the Challenges of Population Aging.” *Brookings*. Accessed March 22, 2020. <https://www.brookings.edu/blog/up-front/2016/05/02/two-solutions-to-the-challenges-of-population-aging/>.

<sup>6</sup> Roy, Hampton, and Charles Russel. *The Encyclopedia of Aging and the Elderly*. Coralville, IA: Medrounds Publications, 2005. Accessed March 20, 2020. <http://www.medrounds.org/encyclopedia-of-aging/2006/01/retirement-age-history-of.html>.

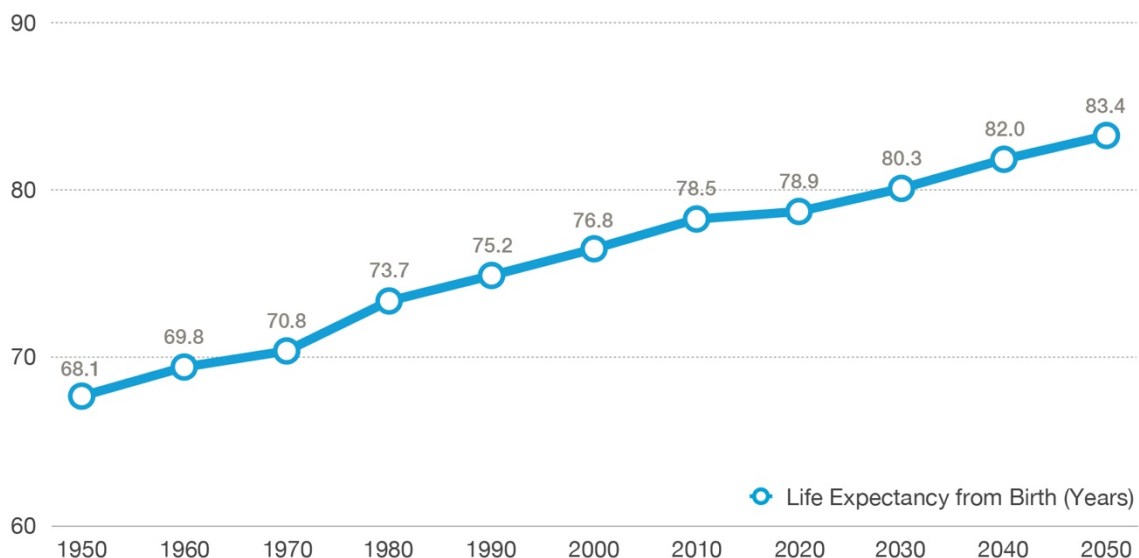


Figure 2-3 Life expectancy from birth  
(Source: author, Data: World Population Prospects)

Longer lifespan implies that the average length of retirement for an American retiring in 2030 will be at least 15 years if they retire at full retirement age 65. The latest survey of Household Economics and Decision-making from the Federal Reserve<sup>7</sup> addresses decisive information that has a directional bearing on retirement: the average retirement age is 59 years old, which would be considered early retirement. Early retirement trend requires future retirees a whole new lifestyle as it generates health care coverage and substantial income gaps for several years. Given this, should late retirement be encouraged as long as life expectancy increases?

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<sup>7</sup> “2018 Survey of Household Economics and Decisionmaking.” *Board of Governors of the Federal Reserve System* (n.d.). Accessed March 22, 2020. [https://www.federalreserve.gov/consumerscommunities/shed\\_data.htm](https://www.federalreserve.gov/consumerscommunities/shed_data.htm).



Figure 2-4 A retiree sitting on a bench alone  
(Source: PxHere Creative Commons Zero, 2017)

## Chapter 3: Turning challenges into opportunities

### Employment, retirement, late-life work, and well-being

Besides income from employment, nonmonetary values of work are unmeasurable.

Firstly, work plays an import role in shaping one's identity and social role and status.

According to a work and education poll conducted by Gallup in 2014 with over 1,000 employed adults, most American workers believe that their jobs define their identity.<sup>8</sup>

Interestingly the poll shows a moderate difference between generations as shown in Figure 3-1. Older workers perceive closer association between their identity and job more likely than younger workers.

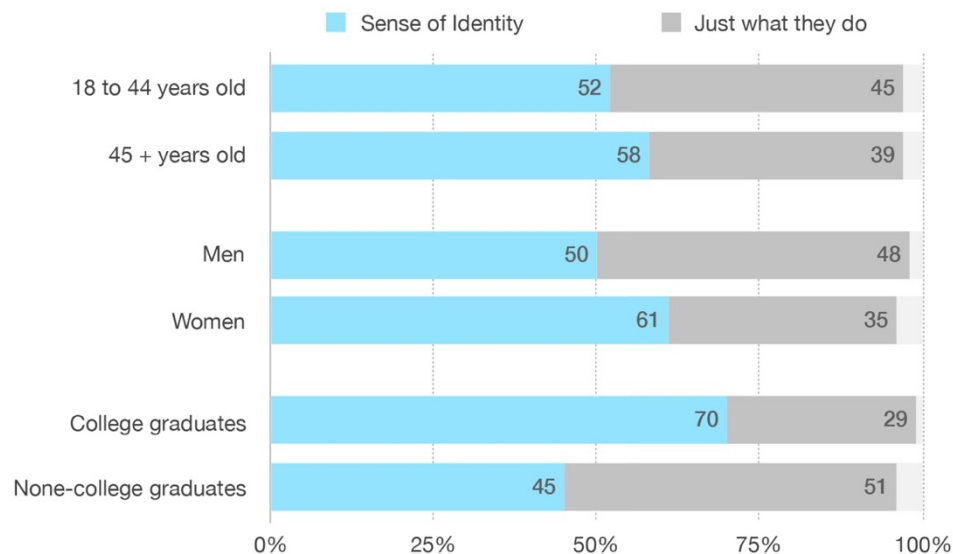


Figure 3-1 Job identity by demographics  
(Source: author, Data: Gallup poll)

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<sup>8</sup> Riffkin, Rebecca. "In U.S., 55% of Workers Get Sense of Identity From Their Job." *Gallup*. Last modified August 22, 2014. Accessed May 1, 2020. <https://news.gallup.com/poll/175400/workers-sense-identity-job.aspx>.

Work in general also gives a sense of being a contributor and a part of serving a bigger mission when it comes to an employment in an organization. Work offers social interaction opportunity – although only fewer 2 out 10 Americans said that they had a meaningful relationship at work.<sup>9</sup> Work could simply provide a purpose to an individual's life from getting up in the morning, going to work to do his own duty, or performing what is due to one throughout a day, week, month, year and even life. Apparently, the key to happiness and satisfaction at work is not money: voluntariness is the important key as proven in a survey that is shown in Figure 3-2. Involuntary work life would not be beneficial to one's well-being, and on average, work life offers a better life satisfaction to those who are remain in the work force than those who do not.

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<sup>9</sup> Thayer-Azoff, Carolyn. "The Proven Benefits of Social Interaction at Work." *Adurolife*. Last modified January 17, 2020. Accessed May 1, 2020. <https://adurolife.com/blog/mental-health/benefits-of-social-interaction-at-work/>.



	HAPPY YESTERDAY	STRESS YESTERDAY	ANGER YESTERDAY	JOB SATISFACTION	IDEAL JOB	BEST POSSIBLE LIFE
No labor force	0.79	0.26	0.14	-	-	6.5
Full-time	0.83	0.39	0.16	0.88	0.73	6.8
PT Voluntarily	0.86	0.30	0.13	0.92	0.75	7.1
PT Involuntarily	0.81	0.41	0.20	0.80	0.61	6.3
Self-employed	0.81	0.40	0.16	0.90	0.83	6.7
Unemployed	0.71	0.44	0.25	-	-	5.5

\* Best Possible Life (BPL) on a scale of 0 to 10. 0 (the worst possible life) and 10 (the best)

\*\* Other inputs are binary coded as 1 (Yes) to 0 (No)



Figure 3-2 Job Satisfaction by employment status in Europe and the U.S.  
(Source: author, Data: Gallup poll)

Additionally, from the health point of view, a sudden transition from decades of daily work to no work for retirement often involves psychosocial status changes that have detrimental impacts on the retiree's both physical and mental health. For example, a study by the Institute of Economic Affairs found that retirement results in decreased

self-assessed health by 40% and increased the probability of clinical depression by 40% and taking a drug by 60%.<sup>10</sup>

Therefore, in order to achieve positive results from work, encouraging older adults to remain in the workforce voluntarily longer and facilitating their employment participation after the retirement age is important.



Figure 3-3 Collaborative workplace culture  
(Source: PxHere Creative Commons Zero, 2018)

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<sup>10</sup> “Retirement Causes a Major Decline in Physical and Mental Health, New Research Finds.” *Institute of Economic Affairs* (n.d.). May 13, 2013. Accessed May 8, 2020. <https://iea.org.uk/in-the-media/press-release/retirement-causes-a-major-decline-in-physical-and-mental-health-new-resea>.

### *The barriers against longer working lives – ageism*

Economic experts encourage older workers to remain longer in the workforce as the most viable solution to the challenges that are associated with population aging; however, many older adults are forced to leave work.

The Age Discrimination in Employment Act (ADEA) was enacted in 1967 to forbid employment discrimination against employees age 40 and older; nonetheless, age discrimination or “ageism”<sup>11</sup> is still prevalent in the workplace. A recent survey of 3,900 respondents – both employed and unemployed 45 years of age or older – reveals the uncomfortable truth about age-related bias: 61% of respondents answered that they faced discrimination, and 91% of respondents who experienced discrimination indicated its prevalence where they work.<sup>12</sup> A Health and Retirement Study of 20,000 people reveals that over half of older workers, age 50 and older, were forced out of their jobs.<sup>13</sup>

Additionally, a study at the Yale School of Public Health found that the negative cultural views of aging damage older adults’ health and increase health care costs annually, reaching \$63 billion.<sup>14</sup> Unfortunately, this bias has a ripple effect, putting everyone at risk regardless of their age. For instance, research on ageism reveals the

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<sup>11</sup> Robert N. Butler, “Age-Isms: Another Form of Bigotry,” *Gerontologist* 9, no. 4 (1967): 243–246.

<sup>12</sup> Perron, Rebecca. “The Value of Experience: Age Discrimination Against Older Workers Persists.” AARPResearch, (2018)

<sup>13</sup> Terrell, Kenneth. “New Study Finds Many Older Workers Forced Out of Jobs.” Last modified December 28, 2018. Accessed March 23, 2020. <https://www.aarp.org/work/working-at-50-plus/info-2018/forced-retirement.html>.

<sup>14</sup> Mahoney, Madison. “Ageism in Health Care Found to Cost \$63 Billion Annually.” *Yaledailynews*. Last modified November 14, 2018. Accessed March 23, 2020. <https://yaledailynews.com/blog/2018/11/14/ageism-in-health-care-found-to-cost-63-billion-annually/>.

problems related to hostility towards older adults and younger adults' exposure to negative stereotypes, with youth who constantly receiving the "too young" remarks in everyday conversation with their parents; teenagers' remarkable ideas being rejected by adults; and younger workers overly being called "kids." Younger people are often considered immature and underdeveloped, thus limiting their autonomy in decision making, causing catastrophic psychological consequences on their transitioning to adult independence.<sup>15</sup>

Explicitly and implicitly, ageism is the most rampant form of discrimination that causes risks to everyone at all age<sup>16</sup>; even worse, people do not recognize for its harmful nature that applies to all persons, including oneself.

### *Reducing ageism and its consequential benefits*

The World Health Organization (WHO) recognized that reducing ageism is key for improving healthy longevity and members' contribution to society<sup>17</sup>. Besides immediate behavior changes on the individual level – such as avoid usage of ageist language and attitudes towards a specific age group – the principal to reduce ageism among young and old adults lies in human nature. A research published in the

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<sup>15</sup> "Ageism: the Youth Perspective." *Ageing Equal*. October 29, 2018. Accessed April 4, 2020. <https://ageing-equal.org/ageism-the-youth-perspective/>.

<sup>16</sup> Seegert, Liz. "How Ageism Can Negatively Affect the Health of Older Adults." *Association of Health Care Journalists*. Last modified June 9, 2016. Accessed April 7, 2020. <https://healthjournalism.org/blog/2016/06/how-ageism-can-negatively-affect-the-health-of-older-adults/>.

<sup>17</sup> "A Global Campaign to Combat Ageism." *The World Health Organization*. Accessed May 6, 2020. <https://www.who.int/bulletin/volumes/96/4/17-202424/en/>.

American Journal of Public Health (AJPH) found that intervention programs – education, intergenerational contact, and combined education and intergenerational contact – all provide generalizable benefits in reducing the levels of self-reported ageism among the participants.<sup>18</sup> The research suggests that the strategies can systemically be adopted as the basic principle of community interventions against ageism.

The most graceful benefits in the intergenerational setting include recovering “the grandparent effect” that is no longer common in modern family construct. The grandparent effect applies when the extended family member benefits from his or her children and grandchildren, bringing substantial benefits in reducing mental illness for both parties.

Nonetheless, people, in general, believe that loneliness, depression, and social isolation are more related to old age, even though in reality, it expands to all ages. Today, over 35 million Americans are living solo, which consists of 28% of the total households in the country.<sup>19</sup> According to a research poll by a health service company, over 20,000 adults revealed that only around half of the respondents reported that they have meaningful in-person interaction daily,<sup>20</sup> while the rest reported that they are feeling alone and isolated. Additionally, Figure 3- 3 shows the

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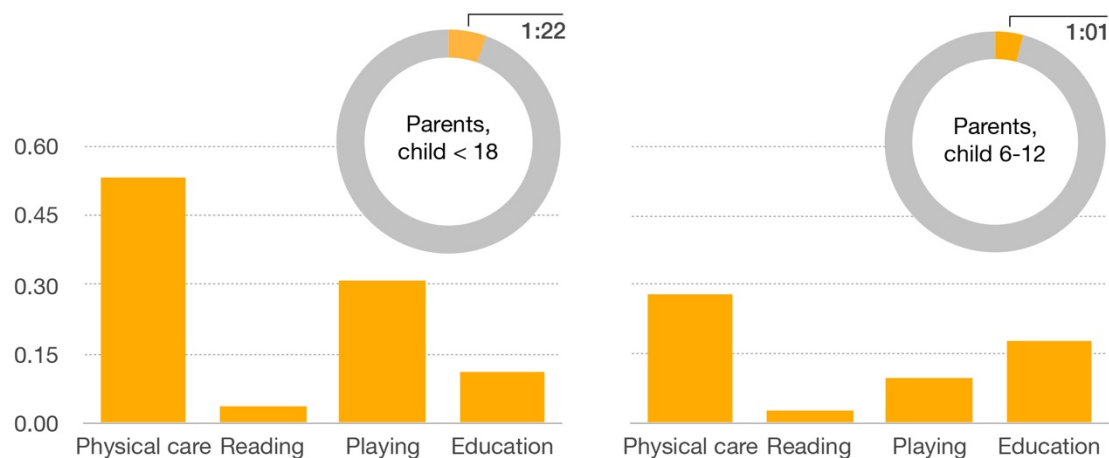
<sup>18</sup> David Burnes et al., “Interventions to Reduce Ageism against Older Adults: A Systematic Review and Meta-Analysis,” *American Journal of Public Health* 109, no. 8 (2019): E1–E9.

<sup>19</sup> “The rise of living alone” *The U.S. Census Bureau*. Accessed April 11, 2020. <https://www.census.gov/content/dam/Census/library/visualizations/time-series/demo/families-and-households/hh-4.pdf>

<sup>20</sup> Polack, Ellie. “New Cigna Study Reveals Loneliness at Epidemic Levels in America.” *Cigna*. Last modified May 1, 2018. Accessed April 12, 2020. <https://www.cigna.com/newsroom/news-releases/2018/new-cigna-study-reveals-loneliness-at-epidemic-levels-in-america>.

disheartened news in this age of screens: on average, American families spend less time together with their little ones, considering the time – nearly doubled – they spend on social media daily.<sup>21</sup>

	PARENTS, CHILD < 18	FATHERS, CHILD < 18	MOTHERS , CHILD < 18	PARENTS, CHILD 6-12	FATHERS, CHILD 6-12	MOTHERS , CHILD 6-12
Physical care	0.53	0.26	0.77	0.28	0.14	0.41
Reading	0.04	0.03	0.06	0.03	0.02	0.04
Playing	0.31	0.23	0.36	0.10	0.10	0.11
Education	0.11	0.07	0.15	0.18	0.10	0.24
Total	1.39	0.87	1.82	1.02	0.69	1.30



\* Time converted in decimal. \*\*Some activities are not shown.

Figure 3-4 Average hours per day parents spent for children in 2018  
(Source: U.S. Bureau of Labor Statistics)

<sup>21</sup> “Average Time Spent Daily on Social Media (Latest 2020 Data).” *BroadbandSearch*. Accessed May 2, 2020. <https://www.broadbandsearch.net/blog/average-daily-time-on-social-media>



Figure 3-5 A kid left alone  
(Source: PxHere Creative Commons Zero, 2017)

Generally speaking, a wave of research alarms on the importance of mental health that has a significant impact on a person's physical health and outcomes in life:<sup>22</sup> The lack of meaningful interactions with others is associated with cognitive decline and an increase of heart disease and stroke in older adults. When it comes to young children and teenagers, loneliness not only affects their academic achievement<sup>23</sup> at schools but

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<sup>22</sup> Burch, Kelly. "Loneliness May Weaken the Immune System – Here's How to Feel Less Lonely during Social Isolation." *Insider*. Last modified April 8, 2020. Accessed April 28, 2020. <https://www.insider.com/does-loneliness-weaken-the-immune-system>.

<sup>23</sup> Malka Margalit, *Lonely Children and Adolescents - Journal of Chemical Information and Modeling*, Springer, 2010. 118–121.

also leads to a weaker health condition later in their adulthood compared with non-isolated ones.<sup>24</sup>

To conclude this chapter, along the same lines as AJPH research, further exploration using community intervention programs that encourage intergenerational engagement and older adults' employment participation will be discussed in chapter 6 to 1.

alleviate the socio-economic issue with the aging population, 2. support longer working lives against ageism, and 3. benefit public wellness.

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<sup>24</sup> Avshalom Caspi et al., "Socially Isolated Children 20 Years Later: Risk of Cardiovascular Disease," *Archives of Pediatrics and Adolescent Medicine* 160, no. 8 (2006): 805–811.



## Chapter 4: Site analysis

### Site selection

Selecting a site began with a demographic analysis of a city in Maryland: diversity in age group, both young and old, was the primary consideration in selecting a site as a “growing together” index. Firstly, three cities, Bethesda, Frederick City, and Silver Spring, were considered for demographic criteria, as shown in Figure 4-1.

Additionally, the percentage of the one-person household among the one-person households is another consideration as the social isolation challenge was discussed in the previous chapter – that is shown in Figure 4-2.

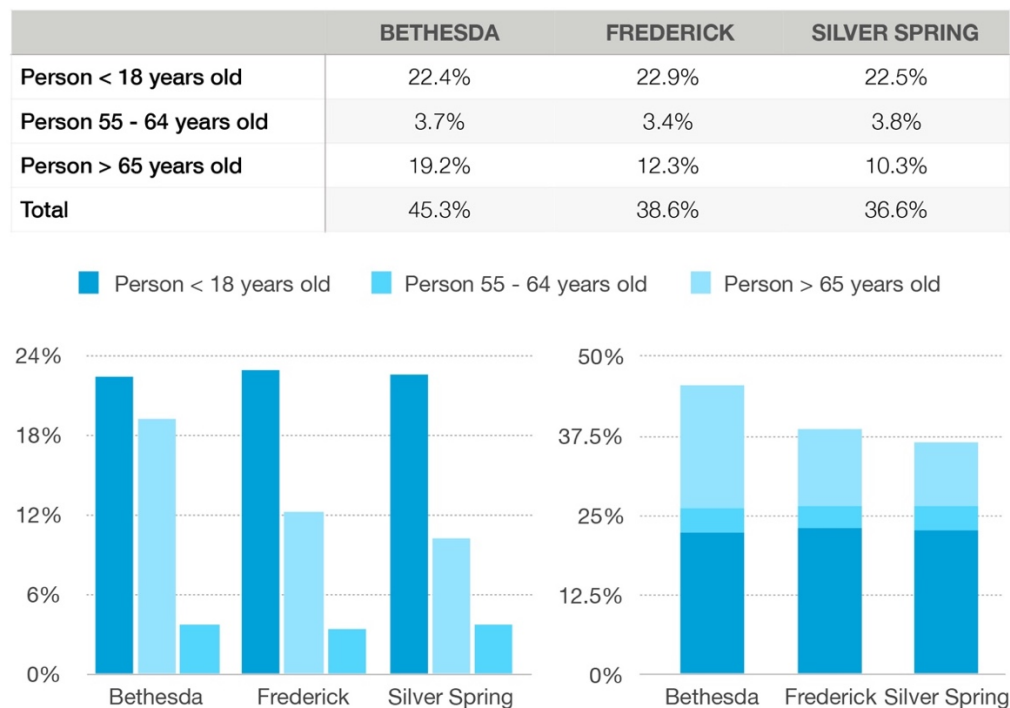


Figure 4-1 Diversity in the age group by city  
(Source: author, Data: U.S. Census Bureau 2020)

	BETHESDA	FREDERICK	SILVER SPRING
One-person Household	7,991	7,995	9,614
One-person Household > 60	4,310	4,769	6,780
Total population	60,858	65,239	71,452

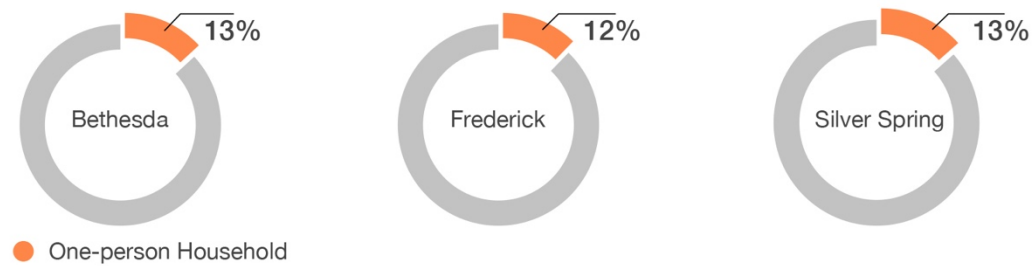


Figure 4-2 One-person household by city  
(Source: author, Data: 2019 Suburban Stats)

The most significant considerations narrowing down to three site areas were accessibility to the site and proximity to educational and health care institutions. The figure and ground maps of each city highlight its core downtown relative to educational and health care institutional buildings.

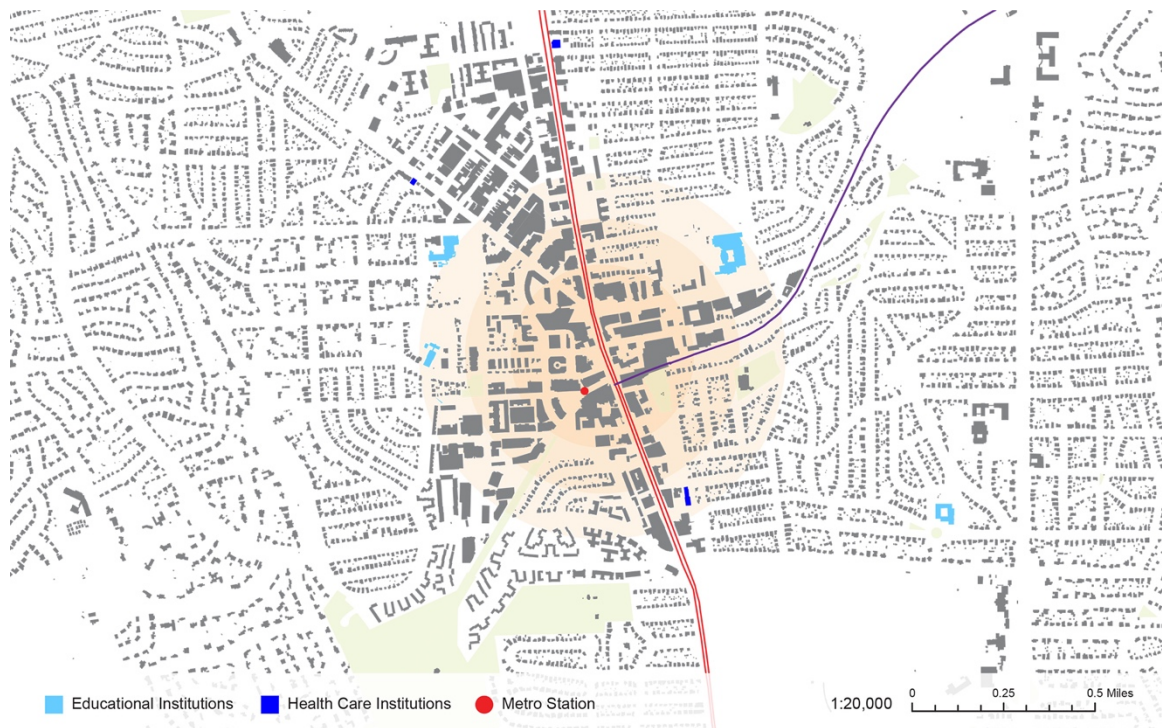


Figure 4-3 Bethesda, Downtown core relative to the institutions  
 (Source: author, Data: Montgomeryplanning.org)

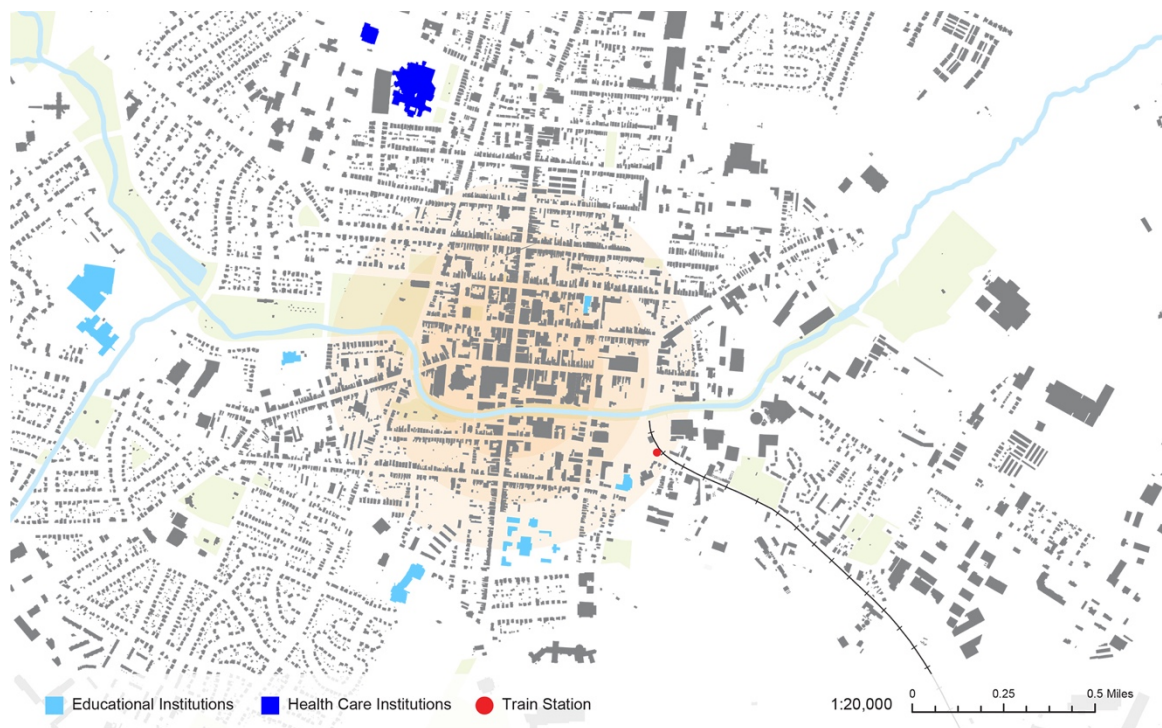


Figure 4-4 Frederick, Downtown core relative to the institutions  
 (Source: author, Data: Frederickcountymd.gov)

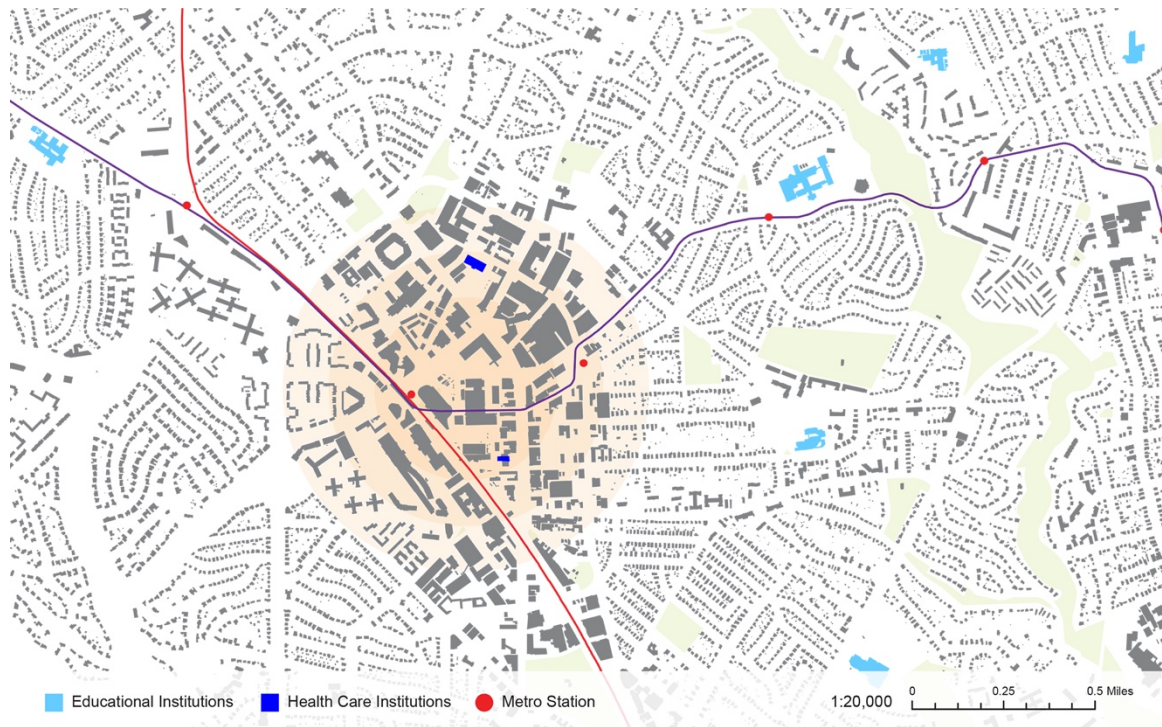


Figure 4-5 Silver Spring, Downtown core relative to the institutions  
(Source: author, Data: Montgomeryplanning.org)

After analyzing the proximity to nearby essential facilities in a 5-minute walk distance, one site from each city was selected as a candidate for the project proposal location. Each of the candidate sites was chosen within its downtown fabric and a half-mile radius from Metro station.



Site candidate 1: 7500 Arlington Rd. Bethesda, MD

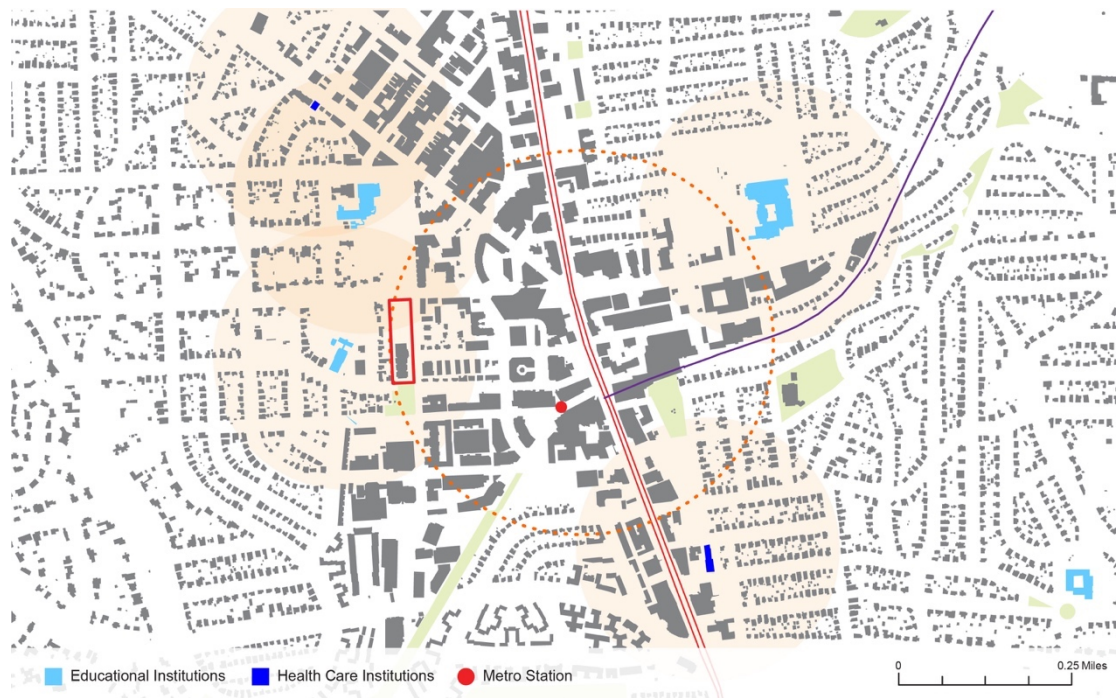


Figure 4-6 Site 1: Bethesda, site selection process (Source: author)

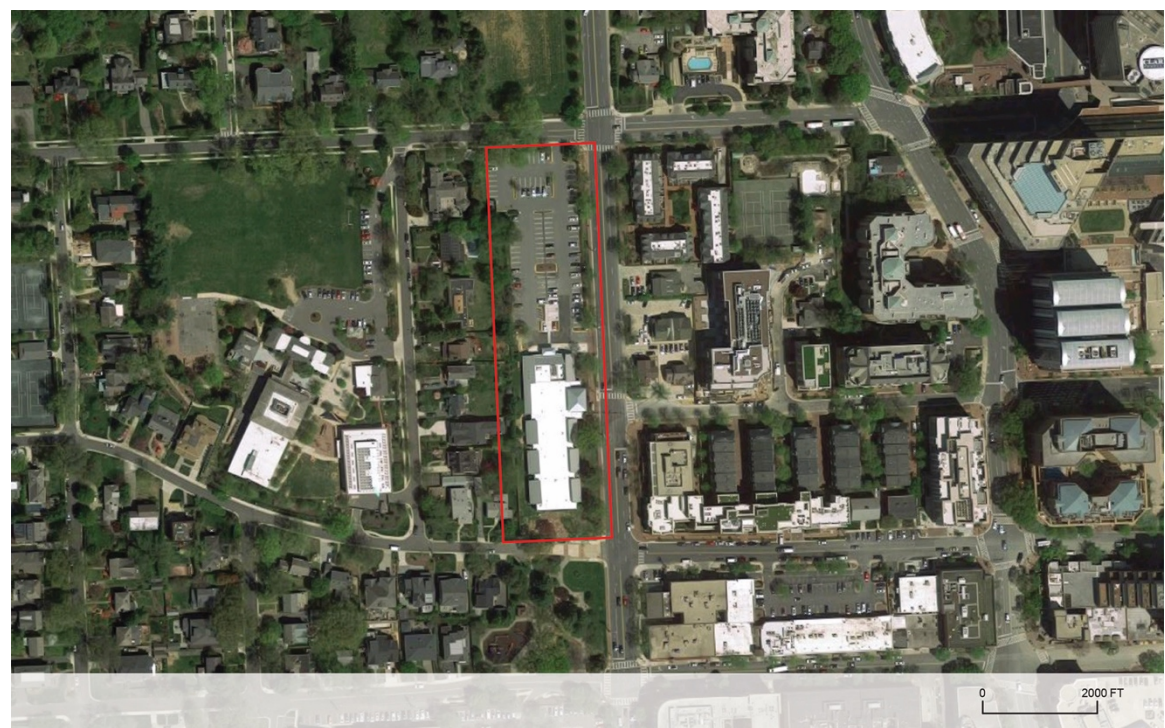


Figure 4-7 Site 1: Bethesda satellite map (Source: author, Data: Google Maps, 2020)

This site located at the intersection of two roads, Arlington Road and Edgemoor Lane, on the west side of a major thoroughfare, Wisconsin Avenue, in Bethesda and Washington, D.C. Because its location, this site entails several opportunities: it lies between two zones, commercial to the east and residential to the West, and could serve as a buffer zone between the two. This location is expected to be highly utilized by prospective users from adjacent institutions – an elementary school located to the North and middle school to the West. The site contains a public library to the South and its parking spaces on the North.

Site candidate 2: 40 S Carroll St. Frederick, MD

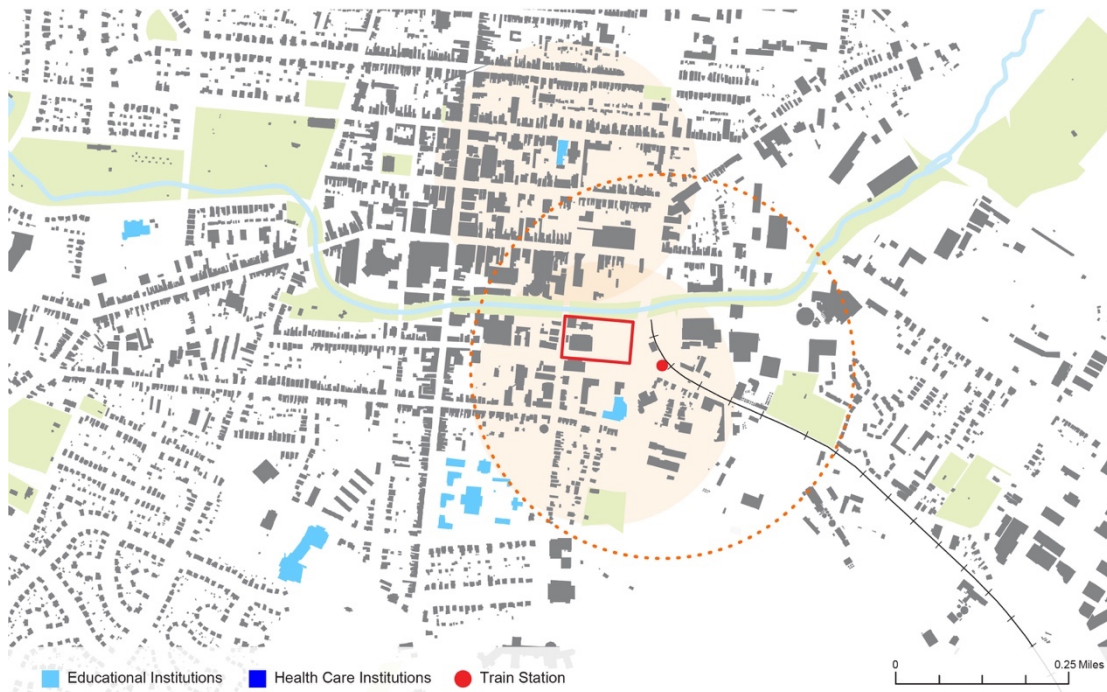


Figure 4-8 Site 2: Frederick, site selection process (Source: author)



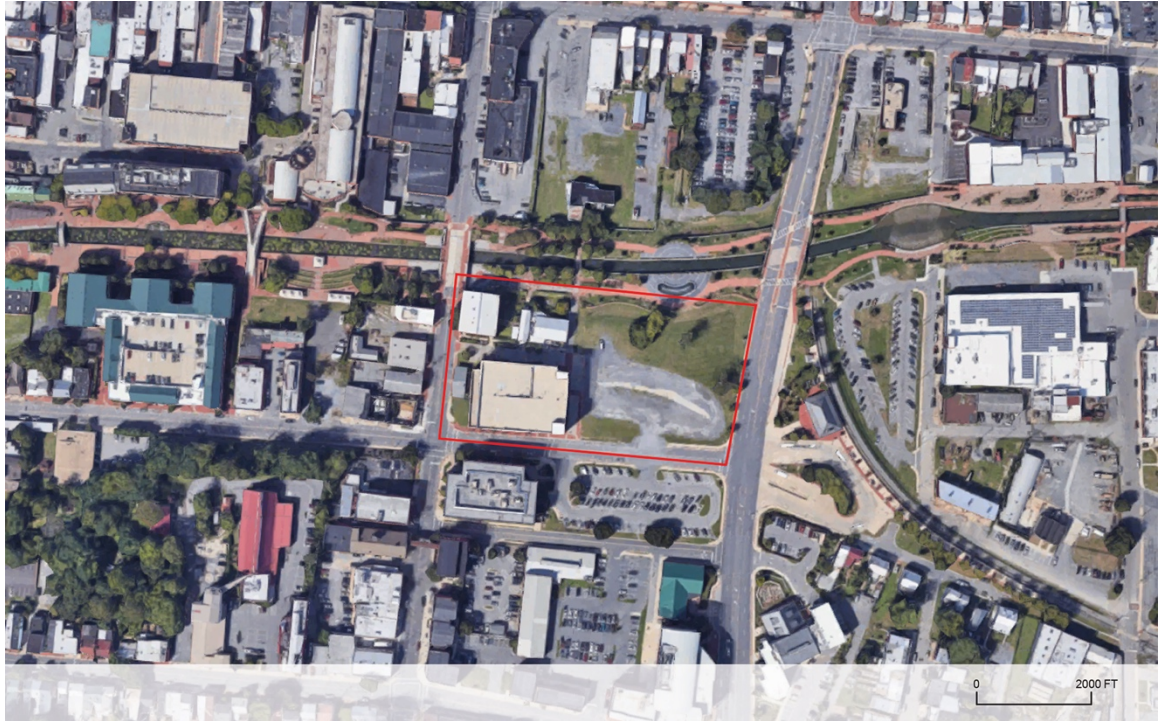


Figure 4-9 Site 2: Frederick Satellite Map (Source: author, Data: Google Maps, 2020)

The site has terrific walkability along the Carroll Creek Park, which features brick walkways, pedestrian bridges, and an outdoor amphitheater. The linear park traverses the downtown of Frederick, and it was built as a flood control project in the wake of the flood in 1976.<sup>25</sup> This location has excellent accessibility from the train station and bus stops. Also, it has a public library located to the Northwest of the site and a public school and Frederick visitor center to the South. This site contains an art center, a

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<sup>25</sup> Panuska, Mallory. “Carroll Creek Flood Control Project Did Its Job during Recent Floods .” *Frederick News-Post*, May 19, 2018. Accessed May 16, 2020. [https://www.fredericknewspost.com/news/politics\\_and\\_government/levels\\_of\\_government/municipal/carroll-creek-flood-control-project-did-its-job-during-recent/article\\_06903b48-2716-5de3-8272-73d58060ffa0.html](https://www.fredericknewspost.com/news/politics_and_government/levels_of_government/municipal/carroll-creek-flood-control-project-did-its-job-during-recent/article_06903b48-2716-5de3-8272-73d58060ffa0.html).

parking garage, and an office building, and it has the best potential to become a landmark site.

Site candidate 3: 909 Thayer Ave. Silver Spring, MD

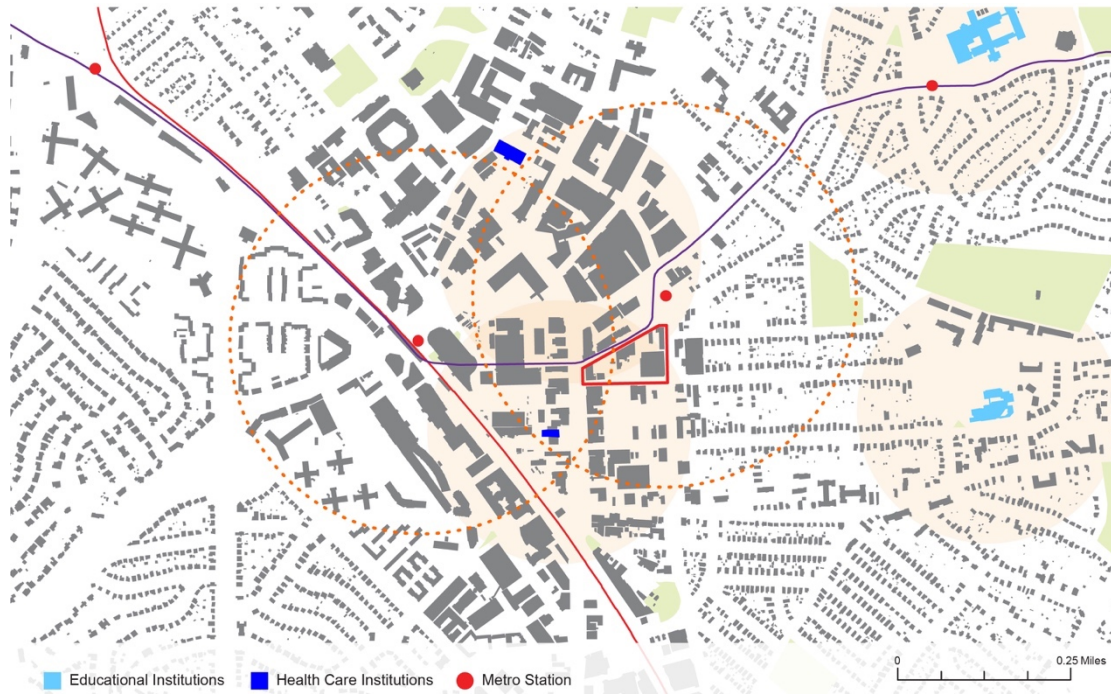


Figure 4-10 Site 3: Silver Spring, site selection process (Source: author)





Figure 4-11 Site 3: Silver Spring satellite map (Source: author, Data: Google Maps, 2020)

The site sits right behind the main intersection of two thoroughfares of the town. The site has the best access to metro stations on the Red and the Purple Lines; however, this site is the farthest site from all institutions while all schools are along the Purple line. The site has a library to the north and a cluster of commercial buildings which might be considered a demolition rather than a repurposing. The site has high rise buildings to the North blocking views from Northern street to the site; thus, it does not have the best possibility of becoming a point of interest.

#### Site selection matrix

Age diversity was the most influential factor in site selection. As follows in the site selection matrix, each site's characteristics were examined based on their

revitalization potential to create a vibrant community. Proximity to public transit, educational institutions, and healthcare providers increase the possibility of promising site candidates, while walkability and vegetation encourage pedestrian activity in the site area.

		Wgt	Site A Bethesda	Site B Frederick	Site C Silver Spring
<i>Growing Possibility</i> Score 1 - 3 The higher is the better	Aging Population	2.0	3	2	1
	Youth Population	2.0	3	2	1
<i>Site Characteristics</i>	Public Transit	1.5	3	2	3
	Proximity to Institutions	1.5	3	2	1
	Proximity to Urgent Care	1.0	2	1	3
	Walkability	1.0	2	3	2
	Vegetation	1.0	3	3	1
	<i>Total</i>		<i>28/30</i>	<i>21/30</i>	<i>16/30</i>

Figure 4-12 Site selection matrix (Source: author)

After assessing the potential of each site, the site in Bethesda was selected as the best site for design exploration.

Chosen site analysis

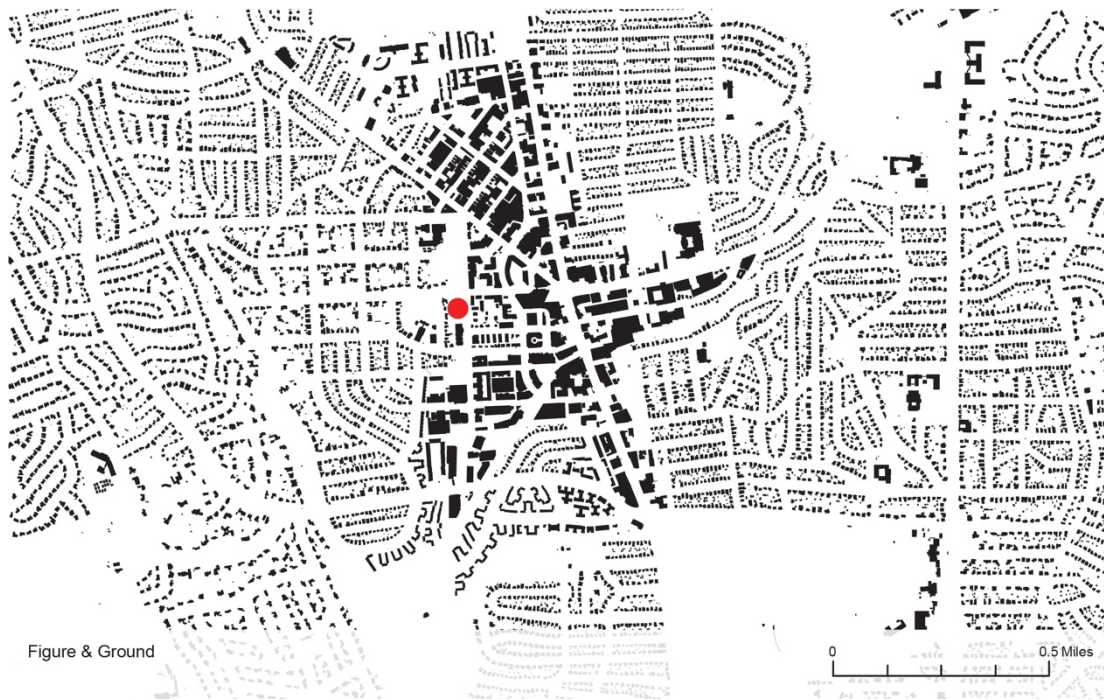


Figure 4-13 Figure – Ground (Source: author)



Figure 4-14 Zoning map (Source: author)





Figure 4-15 Metro stops and 10-minute walksheds relative to the site (Source: author)



Figure 4-16 Educational institutions relative to the site (Source: author)



Figure 4-17 Health care institutions relative to the site (Source: author)



Figure 4-18 Synthesis analysis (Source: author)

The site lies in Residential zone (R-60) in which detached houses or cultural and religious institutional buildings and public use are allowed. Key development standardized codes by Montgomery County are as follows: maximum lot coverage 35%, maximum height 35', front and side street setback 25', rear setback 20', and porches and balconies allowed. While the site is situated in the residential zone with moderate density residential units abutting, Bethesda Downtown Plan (BDP) in 2017 indicates types of land use as public facilities and institutions. The BDP also includes the Northwest lot from the site as a future Greening area, shown in Figure 4-19.



Figure 4-19 Chosen site relative to nearby green (Source: author)

The following Figures show analysis related to site access – metro stops and bike trail, vehicular circulation, Circulator bus route, bus stop, and nearby public parking facility that serves the area.





Figure 4-20 Metro lines and bike trail (Source: author)



Figure 4-21 Vehicular circulation analysis (Source: author)



Figure 4-22 Circulator bus route (Source: author)



Figure 4-23 Bus stops (Source: author)



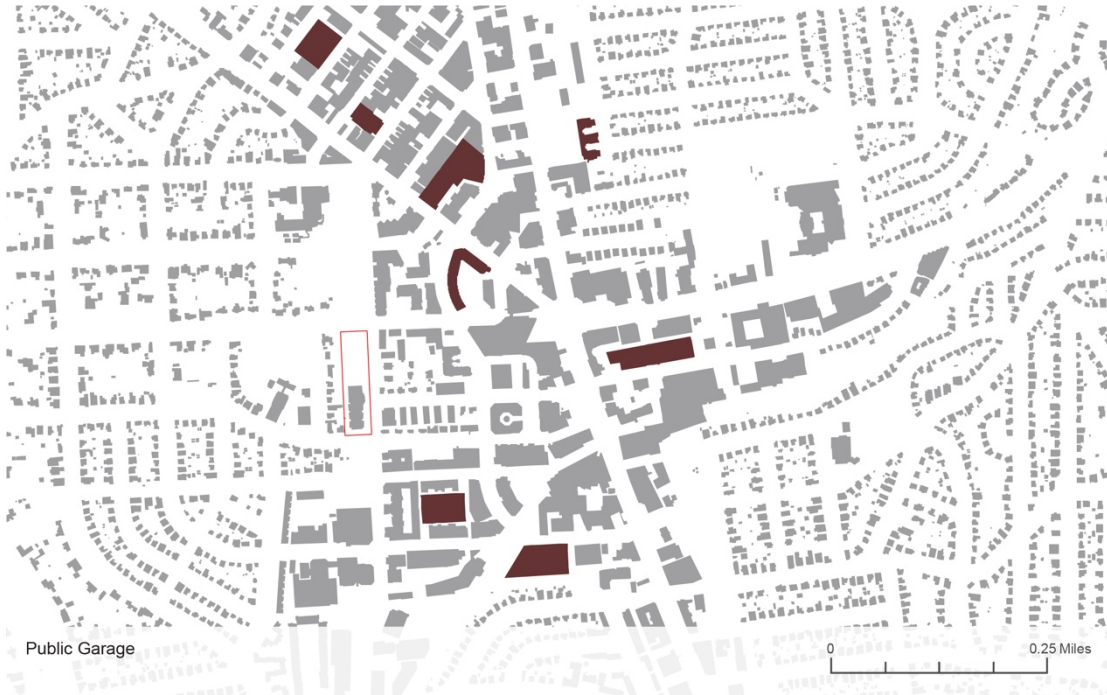


Figure 4-24 Public garage (Source: author)

The site is 24 % occupied by the single-story library building with 0.24 Floor Area Ratio (FAR), while the maximum allowable lot coverage is 35% with 1.05 FAR.

There are also plenty of public parking facilities near the site, as shown in Figure 4-24. In this respect, proposing an additional institutional building into the underused site is nothing strange.

An analysis of the surrounding of the site is shown in the following figures.



Figure 4-25 Site context I (Source: Google maps, author)

The site has three access points from the surrounding streets: in and out driveways from Edgemore Lane, access from Arlington Road, and pedestrian access from the Hampden Lane between the library and the park in the South.



Figure 4-26 Site context II (Source: Google maps, author)

Educational institutions and public amenities are adjacent to the site. Bethesda Elementary School is one block away, Sidwell Friends lower school campus is in close proximity to the West, and Caroline Freeland Park is connected from the Southern edge of the site.



Figure 4-27 Site context III (Source: Google maps, author)

There are various types and uses of buildings across Arlington Road. The areas along the street are anticipated to have denser mix-used commercial and residential buildings due to the fact that it is included within the central business district. On the other side of the site, there are single houses heavily covered by vegetation for privacy concerns.



Figure 4-28 Site context IV (Source: Google maps, author)

The parking lot in front of the library has a parking lot most of the time in the day is vacant, as shown in Figure 4-28. There are double layered wooden fence and wall planters that are separating the site from the residential area on the left of the site.

Figure 4-29 shows its property lines, two-foot contour lines, and Nolli plan of the library. The size of the lot is approximately 145 feet by 680 feet long and there is extra space to the Northwest corner – 190 feet widest. The site map also shows contour lines at 2-foot intervals and gentle slopes to the Northwest. The proposed building's lot coverage is an additional 11% after subtracting the library's lot coverage, 24 %. This results in an 11,000 sq. ft of footprint for the new facility. The maximum buildable gross sq. ft (GSF) can range from 22,000 sq. ft (two-story) to 33,000 sq. ft (three-story).



Figure 4-29 Site map (Source: author)



## Chapter 5: Precedent analysis

Various types of precedents were reviewed to understand the fundamental spaces that the new facility would need and to utilize community integration, contextualization, and sustainability strategies.

### Programmatic precedent

Clemson Architecture Center, WG Clark, 2005, SC, USA



Figure 5-1 Study model  
(Source: Place Matters, ORO edition, Photo: WG Clark's office)

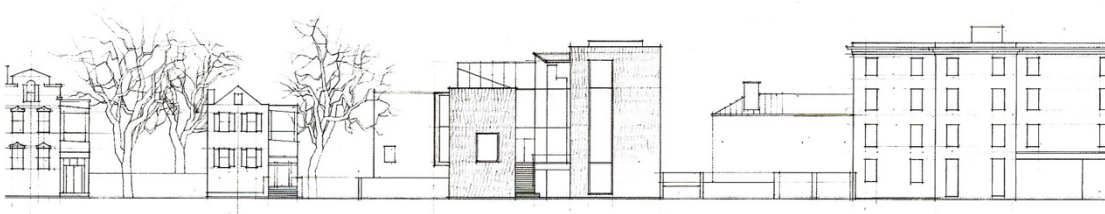


Figure 5-2 Elevation on George street  
(Source: Place Matters, ORO editions, Photo: WG Clark's office)

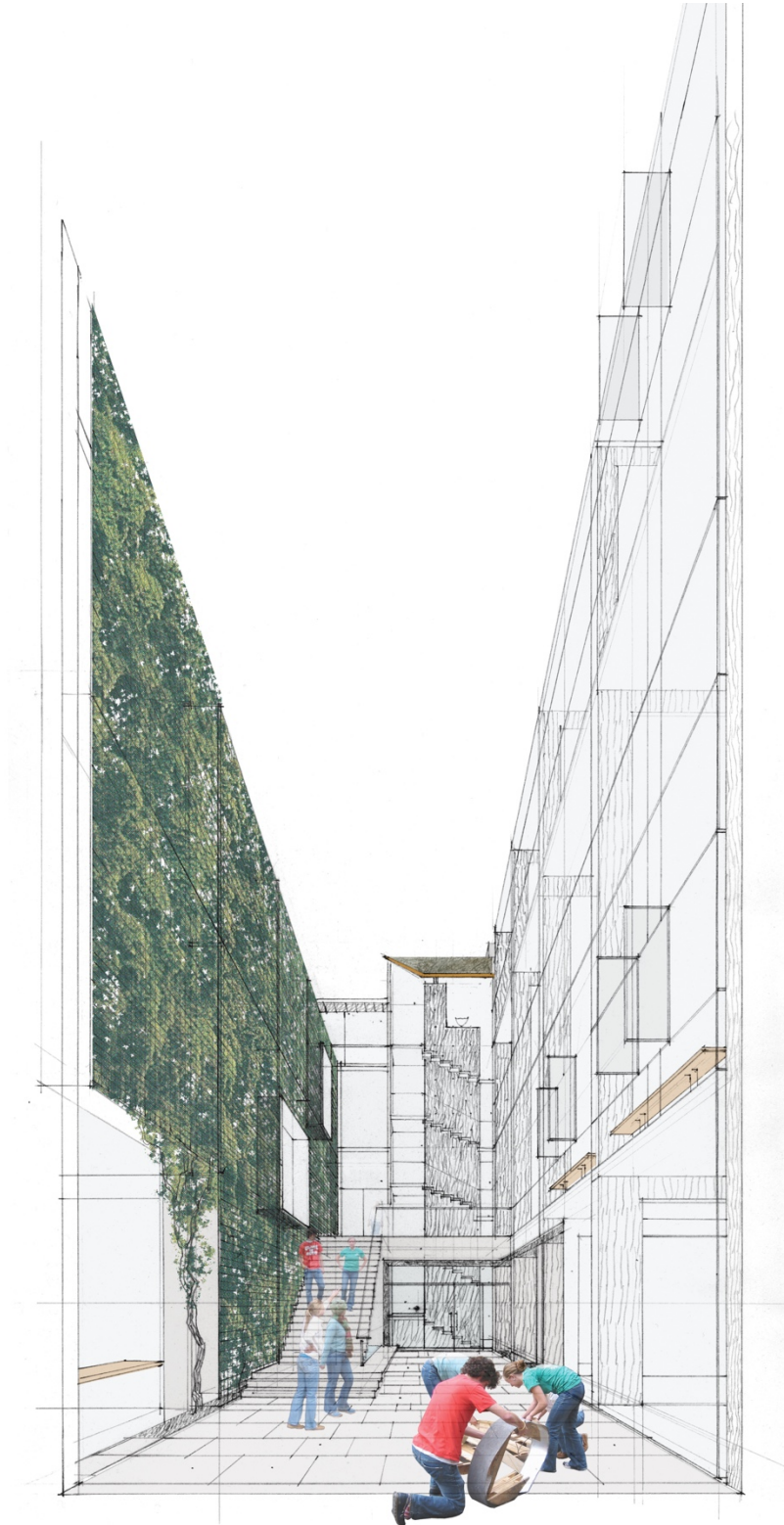


Figure 5-3 Perspective of the courtyard  
(Source: Place Matters, ORO editions, Photo: WG Clark's office)

The institution won the first prize in the competition for the University in Charleston but the project was not realized<sup>26</sup>; However, the unfortunate architecture center is a humbly well-formed modern architecture that blends in its context between residential and commercial buildings without harming the townscape and losing its oneness. The center is U shaped with two wings that each correlate with the adjacent building's height. Having two separate masses creates an intimate courtyard between the two in which brings natural lights and fresh air can come in. The size of the individual rooms was examined to establish spaces needed during the programming procedure in chapter 6. This building encompasses about 31,000 GSF with three stores.

Silver Spring Civic Building, Machado & Silvetti, 2010, MD, USA



Figure 5-4 Overall view of the complex  
(Source: The Work of Machado and Silvetti, ORO edition Photos: ©Anton Grassl/Esto)

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<sup>26</sup> Mccarter, Robert, *Place Matters – The Architecture of WG Clark*. ORO Editions, 2019. 166–173



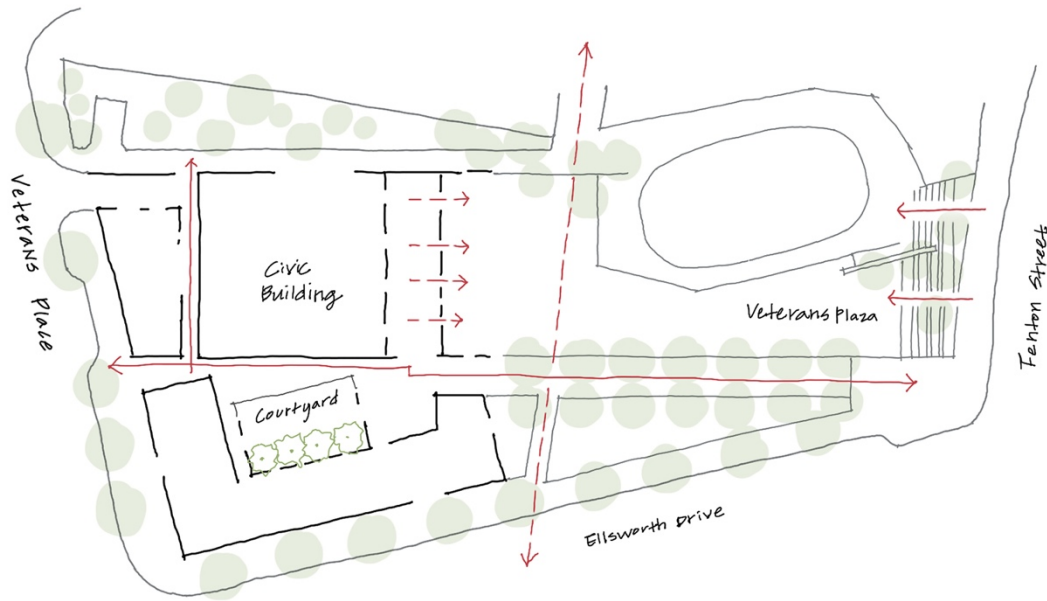


Figure 5-5 Silver Spring Civic Building (Source: author)

The Silver Spring Civic Building at Veterans Plaza opened in 2010. The public open space has been served its community in a variety of capacities from the Memorial Day service in commemoration of Veterans to a series of summer concerts.<sup>27</sup> The civic center complex also has several partners – Betty Mae Kramer Gallery and Music Room, Mosaic Church, Round House Theater, Ice Skating Rink at the plaza<sup>28</sup> – and provides various types of programs for the public. The civic building offers a bright atmosphere to users by incorporating double-height curtain walls, a spacious lounge area facing the plaza, and an uncovered courtyard inside, which increases connection to the outside and nature. The Veterans Plaza was renovated from a plain

<sup>27</sup> “Silver Spring Civic Building at Veterans Plaza.” *Silverspringdowntown*. Accessed May 21, 2020. <https://www.silverspringdowntown.com/go/silver-spring-civic-building-and-veterans-plaza>.

<sup>28</sup> “Silver Spring Civic Building at Veterans Plaza.” *ActiveMontgomery*. Accessed May 21, 2020. <https://www.montgomerycountymd.gov/cupf/info-reservation/SSCB.html#>

grass field to the appearance of today and offers various public outdoor spaces including a lawn, paved plaza with benches, and a shaded area with tables and chairs underneath of the pavilion.



Figure 5-6 Night view from the veterans' plaza  
(Source: The Work of Machado and Silvetti, ORO edition Photos: ©Anton Grassl/Esto)



Figure 5-7 View of interior courtyard  
(Source: The Work of Machado and Silvetti, ORO edition Photos: ©Anton Grassl/Esto)



*Typological precedent*

Säynätsalo Town Hall, Alvar Aalto, 1952, Finland



Figure 5-8 Säynätsalo town hall  
(Source: Zache, Wikipedia Creative Commons, 2007)

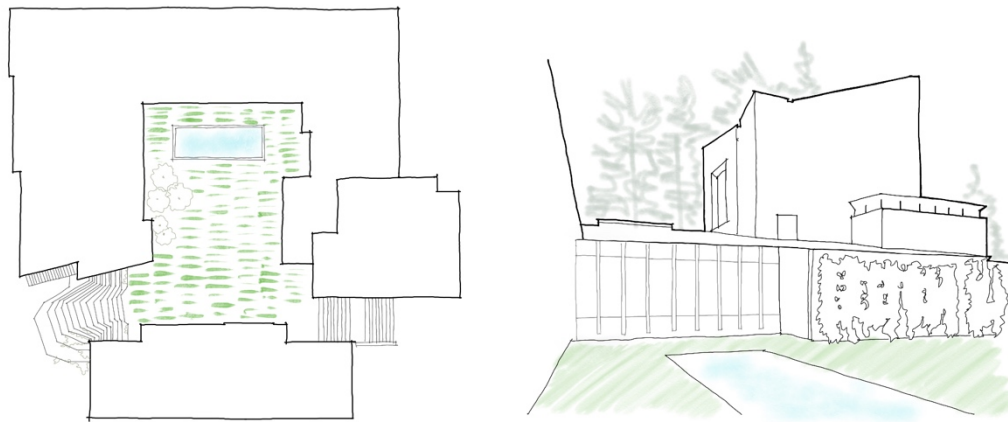


Figure 5-9 Säynätsalo town hall (Source: author)

Although this town hall is 20th-century architecture, it is still an appealing modern building even today. The multi-functional building complex consists of a council chamber, a library, offices, and apartments. The plan has two parts: administrative

spaces organized in a U shape and a single standing library. The lofty chamber provides volumetric hierarchy and plays a role in identifying the architecture as a landmark of the town. The elevated courtyard in a human scale has two access points: a grassy terrace facing southwest and a rectilinear stair on the opposite side, which admits plenty of sunlight throughout the day.

The Bridge, Threefold Architects, 2014, UK

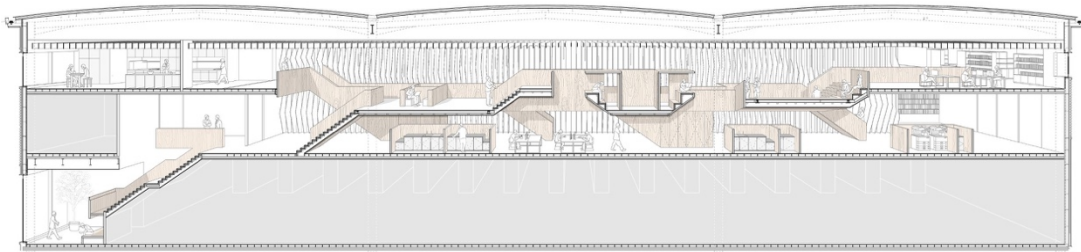


Figure 5-10 Longitudinal section (Source: Threefold Architects)

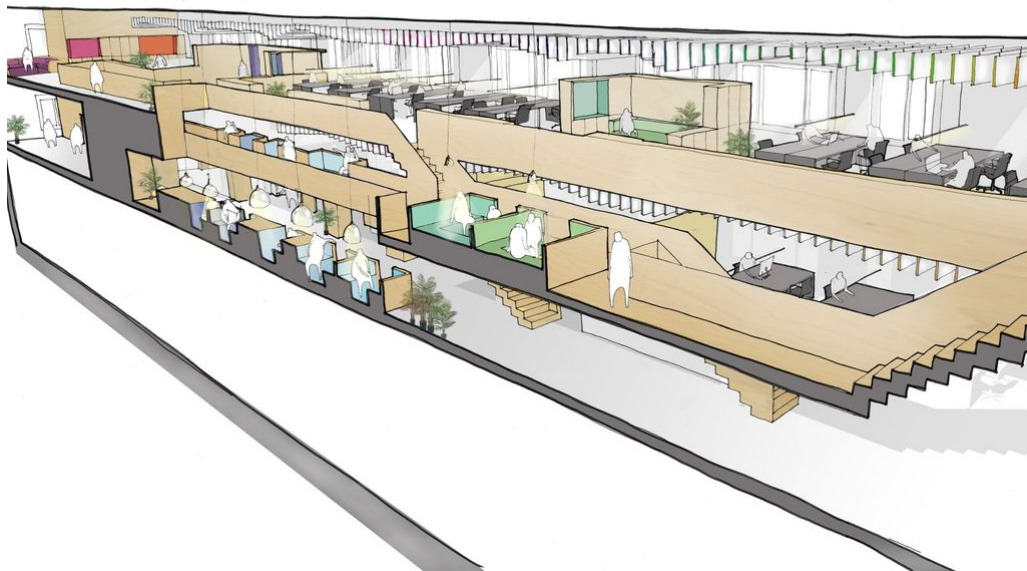


Figure 5-11 Sectional perspective (Source: Threefold Architects)

This project was reviewed as a part of the study of community integration. The Bridge is a workspace for a united company where over 200 employees from three companies are merged under one roof. The stairs were reinterpreted beyond their typical function into a recreational area on the mezzanine floor beyond vertical circulation function that reinforces employees' integration throughout the floors.

### Community precedent

A study of the community that was known for longevity from Blue Zones Project was consulted to learn the lessons from the community – Sardinia in Italy, Okinawa in Japan, Ikaria in Greece, and Loma Linda in California – how people live longest. Blue Zones research found the common characteristics that helped citizens live a healthier and longer life: natural movement (as opposed to common perceptions of exercise), having a purpose of living, eating only until 80% full, following a plant-based diet, a sense of belonging in the community, and treating older people with respect.<sup>29</sup> The research reveals how to improve our surroundings to create a healthy environment with the best practices for both people and communities.

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<sup>29</sup> Buettner, Dan. "0:00 / 19:39How to live to be 100+" *TED-Ed*, April 17, 2013. Accessed April 22, 2020. <https://www.youtube.com/watch?v=ff40YiMmVkU>.

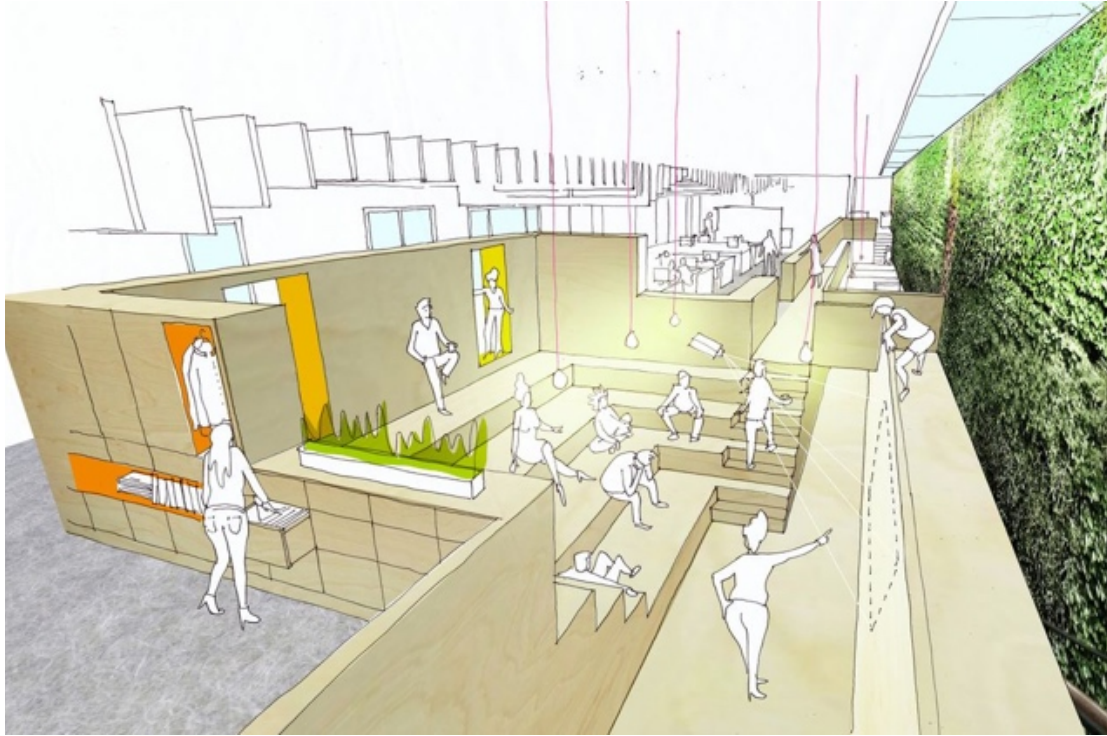


Figure 5-12 The Bridge (Source: Threefold Architects)

## Chapter 6: Programs

The thesis draws on models from higher education and well-integrated communities as precedents to propose a new community intervention model to the Arlington North neighborhood of Bethesda, which has excellent accessibility to institutions and public transportation and a substantial number of the younger and older population. The project aims to explore a new intergenerational spatial fashion that promotes community engagement with everyone of all ages and potentially pass down “togetherness” from one generation to the next.



Figure 6-1 Intergenerational engagement (Source: author)

The new community center in Bethesda, named HUGS (Help Us Grow Strong), is a place to learn and grow together while building a meaningful relationship with each



other as a community. Key programs that HUGS offers to the community are as follows:

1. Educational and Recreational workshops

- Offer education, training, and career guides for older adults who seek to switch careers and enhance their skill sets.
- Equip and encourage older adults to build strong workplace skills.
- Strengthen the relationship between the young and old generation through collaborative play.

2. Aftercare programs

- Include participation in physical, art, literacy activities and homework assistance and are mainly supported by trained staff.

3. Environmental learning program through community gardening and community cooking activity that supports sustainable environmental education and community members' wellness and also acts as an intergenerational engagement component.

To achieve this goal, specific spatial types were utilized from the case studies in the previous chapter.

### Public space



Figure 6-2 Public space (Source: author)

#### Public plaza

The public plaza area connects with the main street and naturally draws people into the space. The plaza promotes outdoor public events occasionally and enriches the streetscape throughout the day. Additionally, the plaza will be covered by pervious pavement and reduce a large amount of the area of driveways and the impervious parking spaces.

### Educational space

#### Classroom & workshop room

Classroom and workshop rooms are relatively larger spaces compared to other individual rooms and serve as the main educational spaces for both adults and children.

### Seminar & meeting room

Seminar and meeting rooms are intimate educational spaces for a group of people.

### Lecture hall & assembly

This multi-purpose room has the capacity to hold over 200 seats and is suited for inviting guest speakers and holding special events. This space is accessible by the public for various types of activities in need.

### Individual booth & personal meeting room

As open collective space is mainly utilized in the program, these personal-scaled spaces were considered for privacy.

### Common space



Figure 6-3 Common space (Source: author)

### Courtyard

The courtyard will be in the semipublic realm that promotes connection to nature and social interaction. The enclosed space increases surveillance for children's "outdoor" activity naturally while people can enjoy lingering around.

### The "Bridge"

Circulation is generously dimensioned and incorporated with sitting space that fosters an active atmosphere and encourages users' interactions.

### Community garden/kitchen

A community garden fosters a genuine social tie and a good sense of community while increasing physical outdoor activity. Especially gardening with children teaches children patience and responsibility as well as building intergenerational bonds through maintenance. With community gardening, members have access to fresh and safe food and can be a part of improving the ecology of the neighborhood. This edible park also creates additional green space.

The community kitchen is a space for preparing snacks during the aftercare program and offering cooking time using produce grown in the community garden.

ROOM/SPACE DESCRIPTION	Qty	SF	TOTAL	NSF
<b>EDUCATION/CULTURAL SPACES</b>				
Classrooms/Workshop	6	650	3,900	
Lecture Hall/Assembly	1	2,400	2,400	
Seminar/Meeting room	6	400	2,400	
Library	1	800	800	
Individual booth	4	20	80	
Meeting room	4	80	320	9,900
Restroom	2	40	80	
Restroom	2	120	240	
Storage	2	200	400	
			10,620	
<b>COMMON SPACES</b>				
Shared coworking/aftercare in open plan	1	2,000	2,000	
high table bar				
bench style				
tables collaboration area				
Intrereactive - indoor	2	1,000	2,000	
Courtyard - exterior	1	TBD	TBD	
Community garden - roof	1	TBD	TBD	
Kitchen	1	400	400	
café		300	300	
Terrace	2	400	800	5,500
			5,950	
<b>ADMINISTRATION</b>				
Common area for staff	1	200	200	
Office in open plan	1	1,200	1,200	
Office	2	150	300	
Meeting room	1	600	600	2,300
Kitchen	1	200	200	
Waiting Area/Lounge	1	250	250	
			2,750	
<b>PARKING &amp; SERVICES</b>				
Loading & Receiving	1	200	200	
Elevator	2	100	200	
Accessible Parking				
Standard Car Parking				
Total NSF				17,700
Grossing Factor				1.5
Estimate GSF				26,550

Figure 6-4 Preliminary program chart (Source: author)

## Chapter 7: Design exploration

The guiding principle of the design exploration for the new facility is to invite people to the site, taking up on the concept of “A whole-hearted invitation” to the city by Jan Gehl. In his book, *Cities for People*, he emphasizes that people interact with and use a space based on the invitation. The intention to invite pedestrian traffic to the built environment makes the place a spirited, safe, and sustainable place for the people.<sup>30</sup>

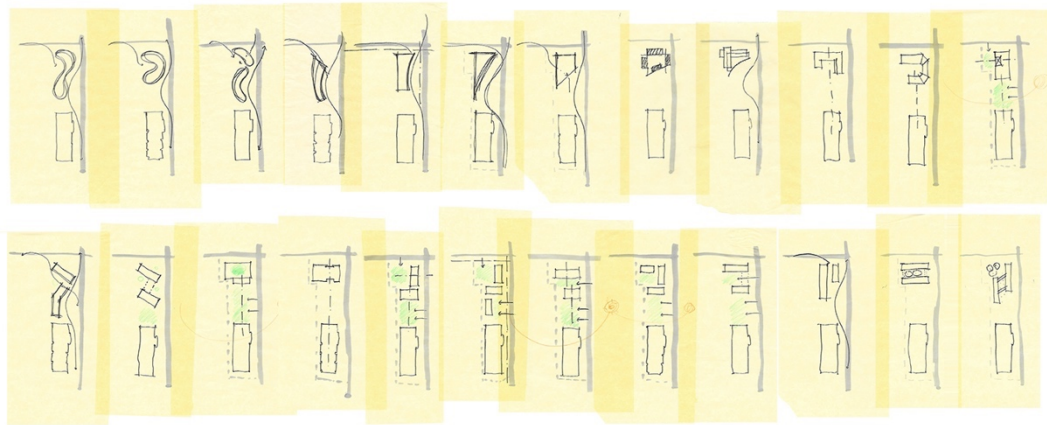


Figure 7-1 Parti exploration (Source: author)

Several spatial strategies were taken from a series of case studies from both well-known architecture and local architecture, as shown in Figure 7-1.

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<sup>30</sup> Gehl, Jan, *Cities for People*. Island Press London, 2010. 55



Figure 7-2 Key spatial strategies (Source: author)

### *Spatial strategies*

These elements are the key drivers applied strategically to create a whole-hearted and inviting atmosphere.

#### Transparency

Transparency between spaces and between the building and the city by adapting curtain walls system directly influences people's behaviors and increases their interests and interaction while working as a kind of exhibition towards the city.

#### Nature elements

Promoting people's connection to nature in the city is another important strategy that transforms the space to become healthier.

#### Collaboration space

Utilizing multi-purpose open spaces rather than individual rooms for every program and prospective use promotes participants' engagement and their lively experience within the building.

Finally, preserving the character of the site and the spirit of the place is another important influential component of the overall design. Common materials around the site area, such as bricks for exterior cladding and wood for the interior finish and structural design, are integrated into the building design. The process of contextualism is displayed in the process diagram Figure 8-4.

#### Early schemes and massing

Several massing concepts were explored earlier in the process. Approximately 27,000 sq. ft of programmed space was needed within an 11,000 sq. ft area, therefore, it was most desirable to have two floors with a mezzanine or three floors.



### Scheme 1 – C shape

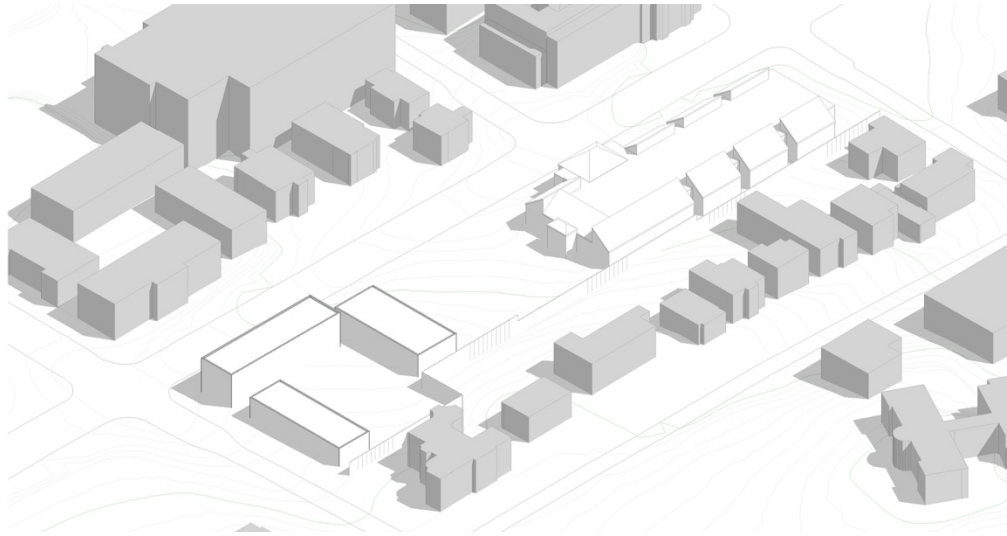


Figure 7-3 Massing concept 1 (Source: author)

The C shape scheme generates an internal courtyard surrounded by three masses and a plaza between the library and the new facility. The massing is placed like a pinwheel, much like the adjacent complex cross the street.

### Scheme 2 – E shape



Figure 7-4 Massing concept 2 (Source: author)

This massing strategy is inspired by the elementary school in Riva San Vitale in Ticino, Switzerland, by Flora Ruchat-Roncati. In the E shape scheme, three bars were placed parallel and captured multiple courtyards between the masses.

Scheme 3 – H shape



Figure 7-5 Massing concept 3 (Source: author)

The H scheme is a more radical approach than others, as it uses the massing placement as a means to create a passageway throughout the entire site. This concept would be an interesting way to activate or introduce the site as a new pedestrian walkway to the neighborhood.

### SWOT analysis

To select an optimal massing strategy, a SWOT analysis for each scheme was conducted as below.













<i>C shaped scheme</i>			
S Strengths 	W Weakness 	O Opportunities 	T Threats 
<ul style="list-style-type: none"> <li>• Spatial hierarchy : masses &amp; public outdoors</li> <li>• Contextual response to the adjacent block.</li> </ul>	<ul style="list-style-type: none"> <li>• Lacking a sense of oneness from having three individual buildings</li> <li>• Inability to avoid exposure to the outside when moving between buildings</li> </ul>	<ul style="list-style-type: none"> <li>• The homelike atmosphere achieved from residential scaled buildings</li> </ul>	<ul style="list-style-type: none"> <li>• Safety</li> </ul>
<i>E shaped scheme</i>			
S Strengths 	W Weakness 	O Opportunities 	T Threats 
<ul style="list-style-type: none"> <li>• Well defined urban edges</li> <li>• Multiple courtyards</li> <li>• South-facing orientation</li> </ul>	<ul style="list-style-type: none"> <li>• Building's front-back confusion</li> <li>• Poor view of the East</li> <li>• Lower floor height</li> </ul>	<ul style="list-style-type: none"> <li>• Terrace design blurs line between indoor and outdoor</li> <li>• Higher likelihood to remain open in a specific circumstance such as Covid-19 closure</li> </ul>	<ul style="list-style-type: none"> <li>• Less accessible between the library and the new facility</li> <li>• Invasion of privacy to the residential area</li> </ul>
<i>H shaped scheme</i>			
S Strengths 	W Weakness 	O Opportunities 	T Threats 
<ul style="list-style-type: none"> <li>• Most open lot for public amenities</li> <li>• Pedestrian passageway</li> </ul>	<ul style="list-style-type: none"> <li>• Building orientation : N-S VS E-W</li> <li>• The greatest distance from one end to the other end</li> </ul>	<ul style="list-style-type: none"> <li>• Linking from north to south greenery beyond the site</li> </ul>	<ul style="list-style-type: none"> <li>• Safety</li> </ul>

Figure 7-6 SWOT analysis (Source: author)

After a comparison of each massing strategy, C and H shaped schemes were further developed with program placements and stacking to ultimately arrive at a new L-shaped mass that combines the two earlier schemes while strengthening the guiding principle as shown in Figure 7-7.

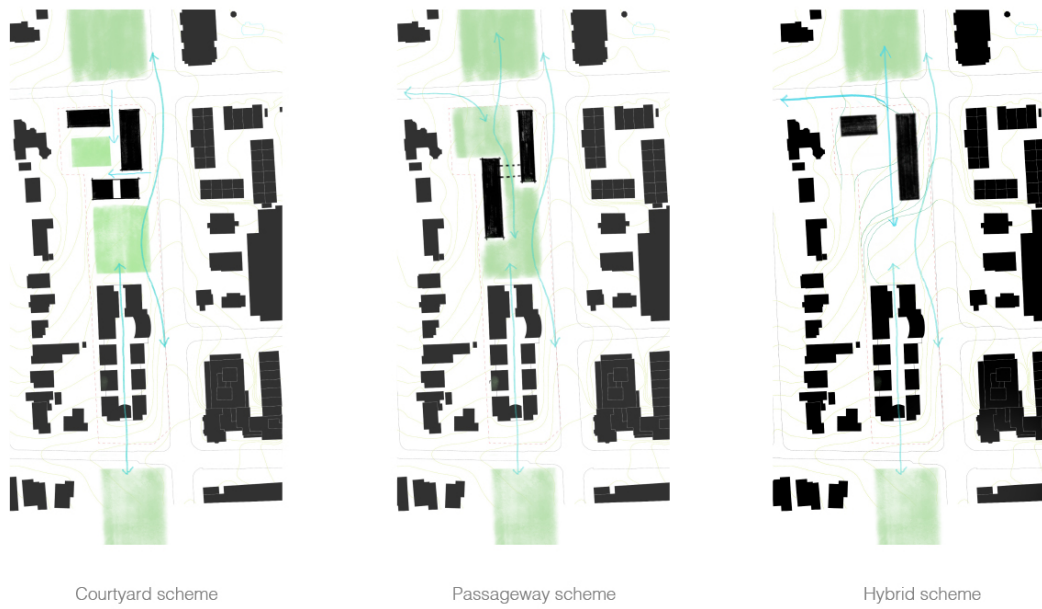


Figure 7-7 Process parti diagrams (Source: author)

## Chapter 8: Design proposal

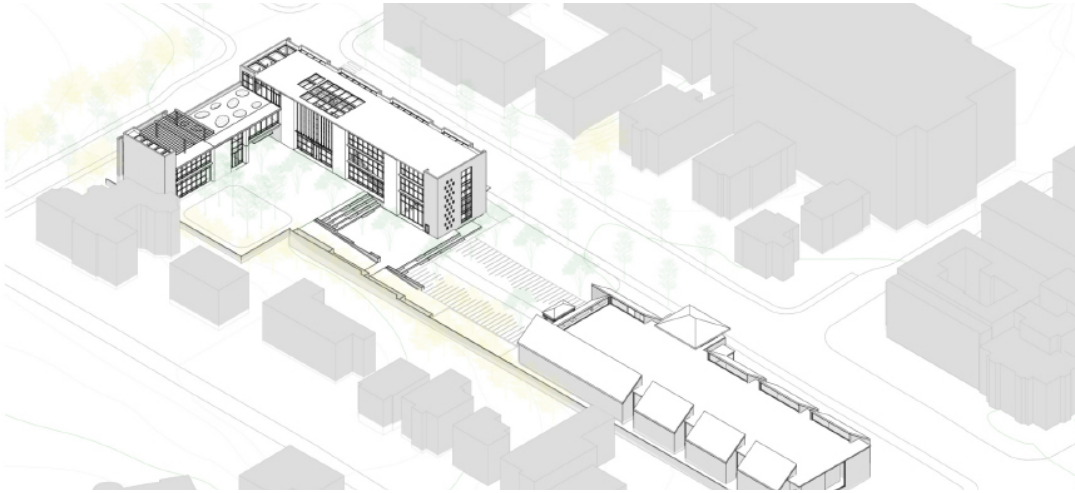


Figure 8-1 Bird's eye view perspective (Source: author)

### Parti diagrams

The selected hybrid scheme starts with grading the topography gently, which has a mild slope up toward the Northwest corner. By doing so, as shown in Figure 8-1 and 8-3 Step D, the gentle slope generates three outdoor spaces on multiple scales.

Positioning massing was done in a way that reinforces the urban edge within the urban fabric. The gap between the two masses also reinforces the N-S axis as well as the urban invitation idea. The street plane extends into the building; therefore, this scheme achieves vitality on the ground level between building occupants and people on the street.





Figure 8-2 Parti diagrams in plan (Source: author)

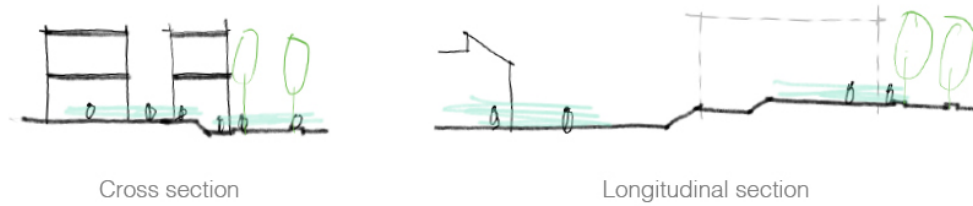


Figure 8-3 Parti diagrams in section (Source: author)

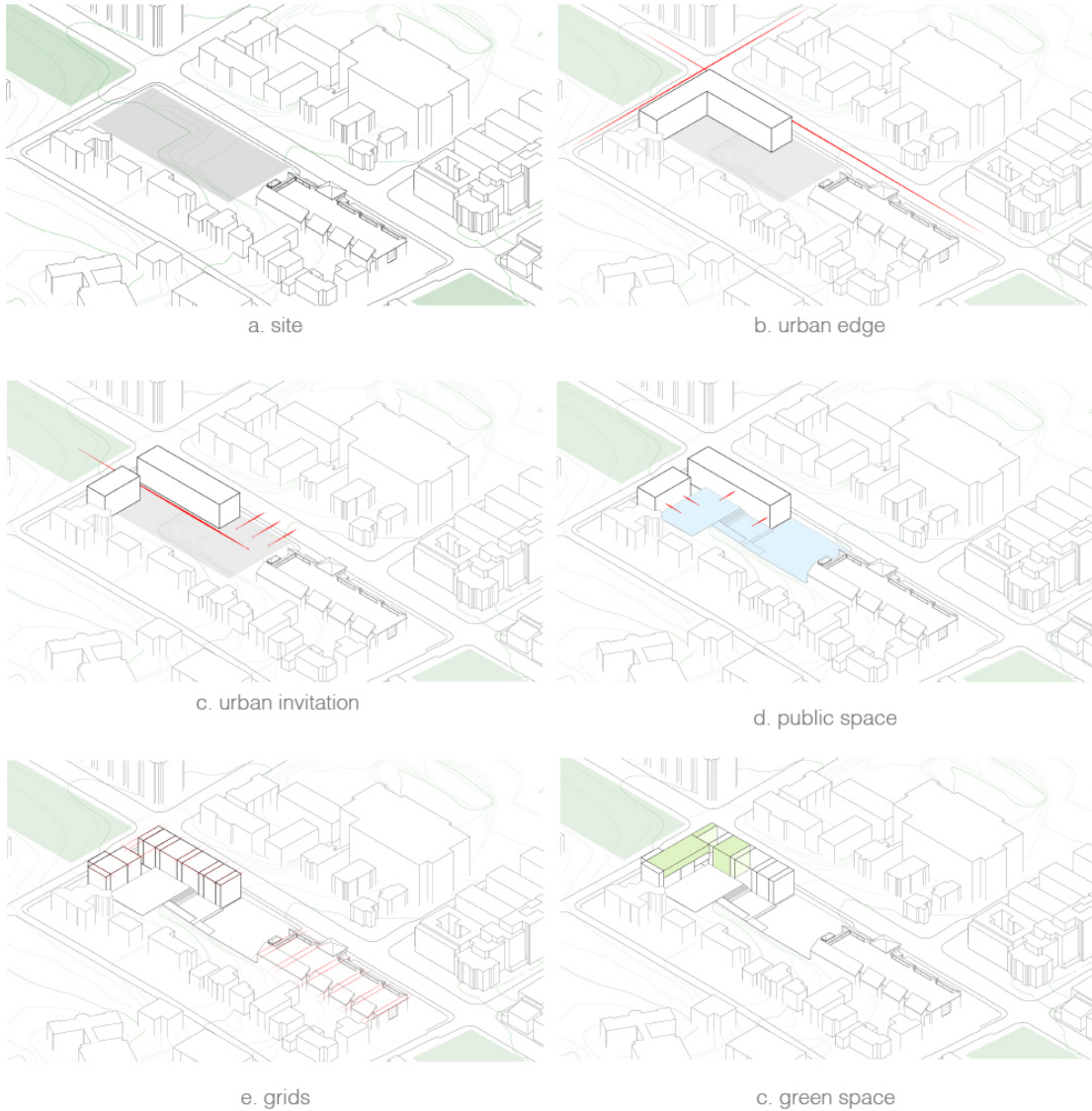


Figure 8-4 Parti diagrams in axon (Source: author)

### Plan, section & elevation drawings

#### Site plan

The site plan shows that the landscape is not only reinforcing the N-S axis but is also defining the space. The southern plaza is designed with a mix of hardscapes and softscapes with grass strips that also fortify the axis.



Figure 8-5 Site plan (Source: author)

## Plans

The organization of programs is driven by the guiding principle. The public programs – lecture hall, small library, shared space, community kitchen – are placed on the ground level for accessibility. Other programs that require smaller square footages and privacy are located on the upper levels.



Figure 8-6 Plans (Source: author)

## Sections & Elevations

Sections show spatial hierarchy, especially the presence of an atrium in the center of the building. The staircase that connects from level one to level three in the eastern building is a ceremonial vertical circulation that enables the users to experience the depth of space and to feel somewhat as if they are outdoor while they move up and down indoors.



Figure 8-7 Sections (Source: author)

The elevations show proportions and materiality. The different treatments of the façade – perforated brick walls and glazing curtain walls – subtly adjust the level of openness in each space.



Figure 8-8 Elevations (Source: author)

The site section and elevation along Arlington Road shows the same structural order repetition throughout the site and along the pedestrian passageway from the plaza to the northern street.

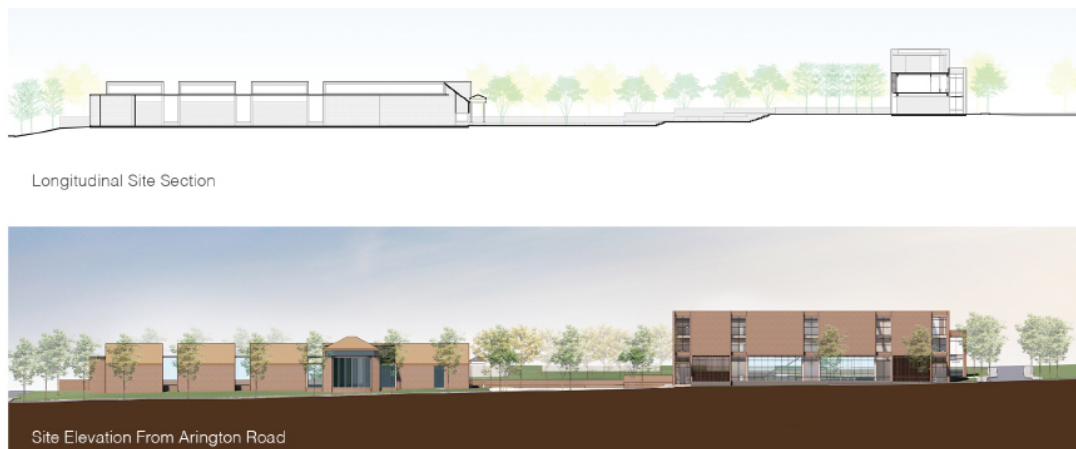


Figure 8-9 Site section and elevation (Source: author)



## Other diagrams

### Exploded axon

The exploded axon shows other details 3-dimensionally as shown in Figure 8-10.

Mass timber acts as the building structure and gives a sense of warmth against the exposed finish. Various shading devices were placed on the courtyard facing façade.

Operable shutters work both horizontally and vertically, depending on their orientations. Semi-transparent vertical fins on the courtyard-facing entrance pronounce the entrance location.

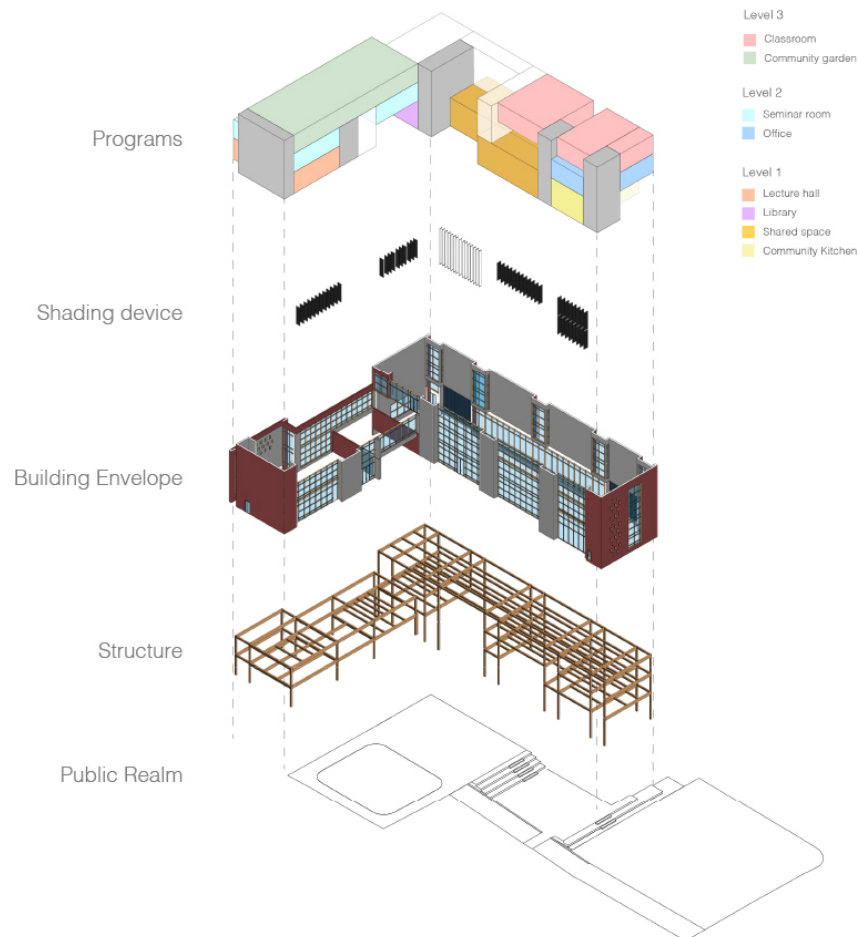


Figure 8-10 Exploded axon (Source: author)

## Renderings

### Exteriors

The main perspective view of HUGS community center displays the human scale components – canopies, wooden soffits, and smaller curtain wall panels – that allow the institutional building to be experienced at the human scale.



Figure 8-11 North-East corner (Source: author)

The internal courtyard rendering reveals sun control and shading devices in the background. Similarly, trees and vegetation also provide shade seasonally in addition to the other environmental benefits of trees. The courtyard can be utilized as an outdoor classroom occasionally and for other activities with movable furniture.



Figure 8-12 Courtyard (Source: author)

This image is taken from the elementary school field, which is located on the north of the site. The portal is a shortcut for students to enter the facility.

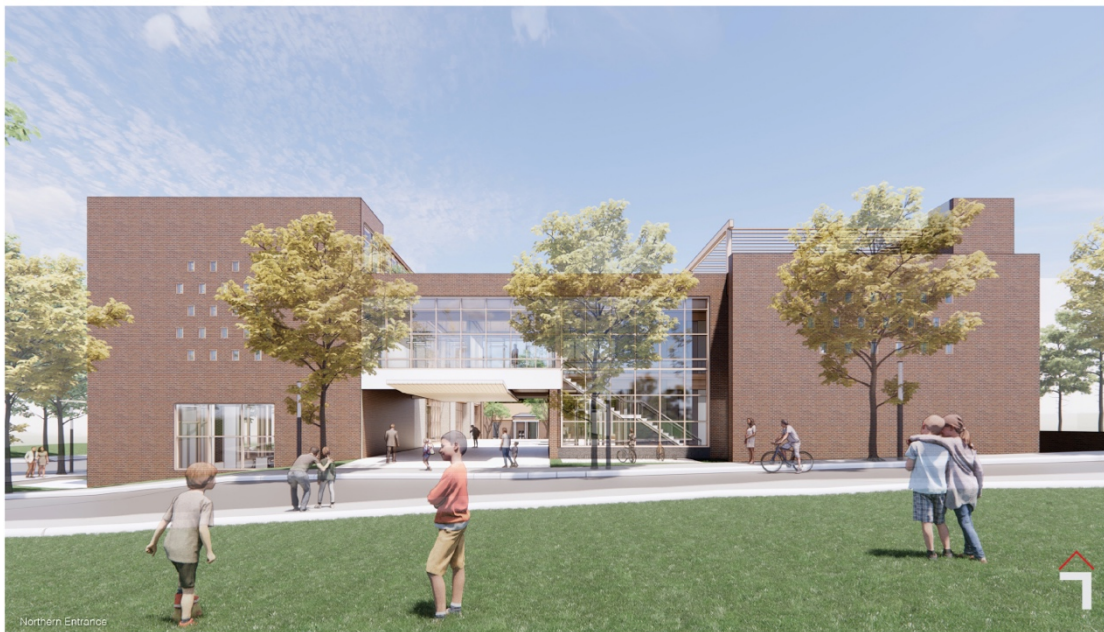


Figure 8-13 Northern perspective (Source: author)



The public plaza has the capacity to hold all types and sizes of events and activities.



Figure 8-14 Plaza (Source: author)

Growing fruits, vegetables, and plants in the garden functions beyond personal enrichment. Rather, it is a long-term investment in environmental education, since maintaining the garden and obtaining tangible outcomes requires dedicated effort, time, and exercise.



Figure 8-15 Community roof garden (Source: author)

## Interiors

The HUGS community center has major interior spaces that encourage participants interactions. The community kitchen provides a lounge area that completely opens towards the interstitial outdoor space with rotating doors.



Figure 8-16 Community kitchen (Source: author)

The open work environment in the shared space benefits users as it increases productivity and accountability. Shared space is actively utilized for adults earlier in the day and for school-aged kids later in the day. This space anticipates that there are enough overlapping times that different aged groups meet.





Figure 8-17 Shared space (Source: author)

The atrium is a type of space that feels like an outdoor environment. The small balconies poke out for viewing purposes without disturbing foot traffic.



Figure 8-18 Atrium (Source: author)



This space is where two buildings meet – the Bridge. It is also an extension of the atrium area and strengthens the intention of creating an indoor space that feels like the outdoors.



Figure 8-19 Bridge (Source: author)



Figure 8-20 Classroom and hallway (Source: author)

This image portrays typical classrooms and seminar rooms' hallway. A sitting area is provided in every bay for various activities. The spatial transparency promotes safety and shared learning experiences.

## Chapter 9: Conclusion

This thesis is about recovering the underappreciated wisdom of experience, the strength of the human connection, and human nature and capacity through the built environment — place by people and for people.

“Man naturally desires, not only to be loved, but to be lovely; or to be that thing which is the natural and proper object of love. He naturally dreads, not only to be hated, but to be hateful; or to be that thing which is the natural and proper object of hatred.” (Smith 1790, 6<sup>th</sup> edition 102)

Whether someone admits it or not, our society, in general, views the elderly or aging process unfavorably, although it is merely a part of the human life cycle. The quote from Adam Smith’s 1749 works, *The Theory of Moral Sentiments*, urges us to change the way we look at people and look at ourselves.

In the same spirit, architecture shapes the way we live, work, and think and a built environment rooted in the spirit inspires us to do just that – change the way we view ourselves and others – as lovely beings.

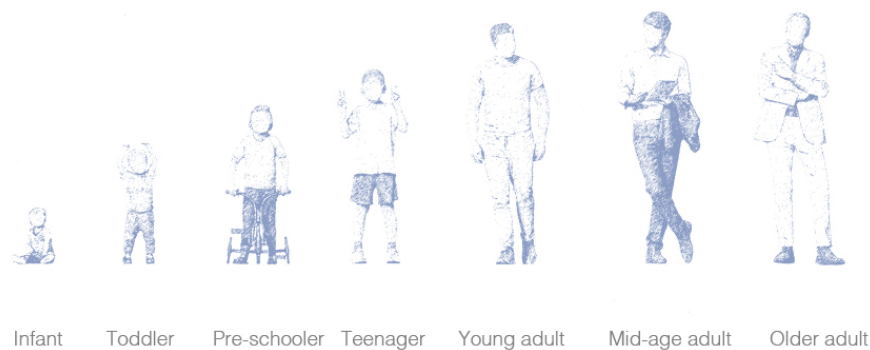
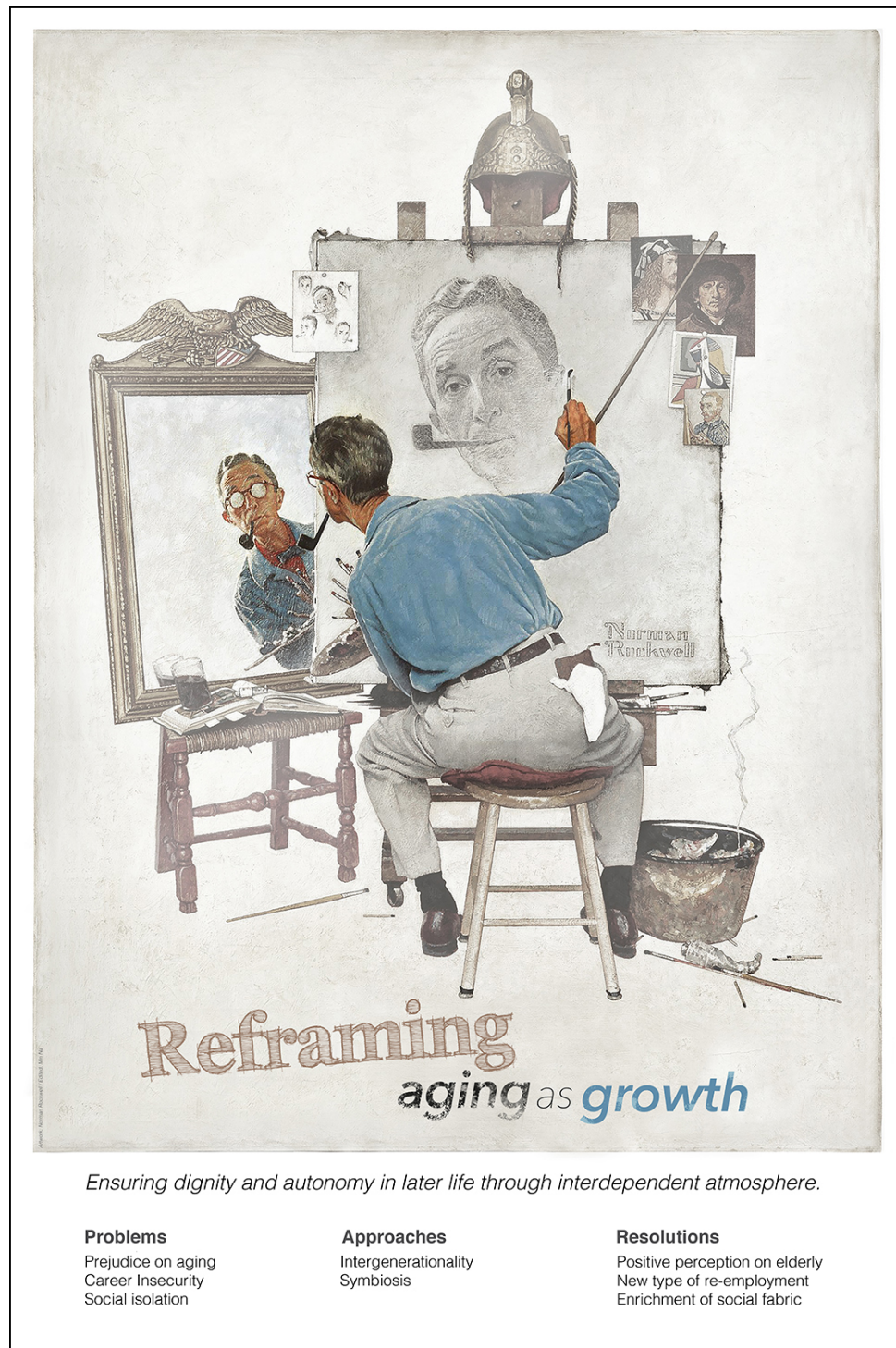


Figure 9-1 Human life cycle (Source: author)





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